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THE IRON AGE

Contents

JANUARY 19, 1939

Cost Reductions More Needed Than Armaments 19
Welded Continuous Rayon Spinning Machine 21
Pulverized Coal for Metallurgical Furnaces 27
Galvanized Coatings 30
Design Advances in Cutters, Small Tools and Gages 36
Bridgeport Brass Opens New Rolling Mill 40
On the Assembly Line 46
Washington News 50
THE NEWS IN BRIEF 64
Weekly Ingot Operating Rate 73
Rate of Activity in Capital Goods 73
Plant Expansion and Equipment Buying 88

▼ ▼ ▼

Just Between Us Two 96
Products Advertised 99
Index to Advertisers 122

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▲▲▲ THE IRON AGE ▲▲▲

JANUARY 19, 1939

ESTABLISHED 1855 Vol. 143, No. 3

Cost Reductions More Needed Than Armaments

NOW, we are considering a plan to preserve peace on earth and make the world safe for democracy by arming America "to the teeth."

The thought behind this is that if we have enough battleships and guns and airplanes and ammunition, nobody will want to start trouble for fear that we will be drawn into it and that "our side" would undoubtedly win.

If this program goes through, it will mean keeping a large part of our best and most modern machine equipment tied up on war material production for months or years to come. And it will also mean discarding a good part of our present mechanical equipment and replacing it with up-to-date machinery, since you cannot turn out satisfactory war products with anything but the best.

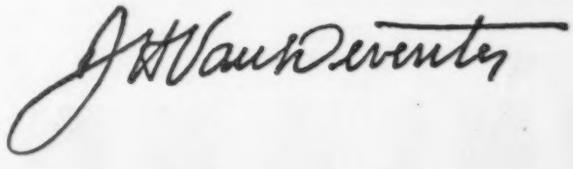
This same high-class production equipment could, of course, do a remarkable job of cost reduction—and price reduction—on behalf of America and other consumers if it were applied to making needed peace-time products. A 10 per cent reduction in the prices of the things we have to buy is better than a 10 per cent increase in the individual incomes of the people who have to buy things, from the standpoint of public welfare.

Applied to munitions making, this same equipment will be a double-barreled cost and price increaser. First, because its cost and operation expense must be met by the public and, second, because wholesale diversion of skill and energy to war production will inevitably increase the cost and price of peace products.

Germany's people must be paying dearly indeed, in this respect, for the maintenance of 500,000 workers on military aircraft production—more than we employ in the automobile industry of the United States. And Germany has a working population of but a third of ours.

How long can a nation keep on multiplying this non-productive overhead? Perhaps after you once start an armament race, the only way to avoid bankruptcy is to gamble on conquest.

We are told that the capacity of a country to produce munitions quickly when needed is more important than an existing supply of war materials. If so, would not the best armament program for us consist in a National policy of encouraging industrial plant modernization? If war then became imminent, we would find ourselves able to meet it; if it did not, we would have made a splendid self-liquidating, price reducing investment on behalf of the public.



it's speed that counts

. . . IN CUTTING MACHINING COSTS, TOO

Time is money when a racing car roars over the track against the field, speeding for the cash prizes.

Time is money, too, when machine tools work with highest efficiency competing against those of every other manufacturer.

A new advantage is now available, enabling you to produce machined steel parts at greatly increased speeds. Or, you can use steels with higher physical properties at no increase in machining time or cost.

HOW

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Many parts makers have been using Inland Ledloy for months, with such cost-saving results as the following:

A forging company saved 30¢ per crankshaft produced. An automobile parts manufacturer reduced machining time on a part from 11 seconds to 3½ seconds. A household equipment manufacturer increased machining production from 918 to 1,330 parts per hour. Savings range from a few dollars to more than $50 per ton of Inland Ledloy used.

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INLAND PRODUCTS INCLUDE: *SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCING BARS*

Continuous Rayon Spinning Machine of Welded Steel Construction

o o o

By R. F. BERGMANN*
Chief Engineer, Rayon Machinery Corp., Cleveland, Ohio

o o o

INDUSTRIAL RAYON CORP.'s 14-acre plant at Painesville, Ohio, has started operations with the world's first commercial installation of equipment for the continuous spinning, processing, drying and twisting of viscose rayon yarn for woven fabrics.

Seven to nine heretofore independent operations are combined in a single machine, the co-ordination made commercially successful by an ingenious, highly developed reel composed of chemically resistant molded plastic members, and by the use of arc welded steel members and light weight metal closures throughout the structure required for the composite machines. The high degree of accuracy and rigidity required to maintain perfect alinement of hundreds of moving parts was obtained with maximum economy through unusual jig welding procedure.

In the initial processing, cellulose fibre sheets are dissolved in a series of controlled chemical baths to form liquid rayon or viscose, which is piped to the spinning room. This liquid rayon is forced through the minute holes of a jet or spinneret submerged in the acid bath in lead lined, glass-enclosed spin tanks at the top of each machine. The machines are three tiers high, operations starting at the top and continuing downward. Fig. 1 shows a machine during installation and Fig. 2 shows the spin tank.

The viscose coagulates on leaving the jet and entering the bath, each hole producing a separate and distinct filament of the yarn as in all rayon manufacture. Instead of being wound directly into a package and treated through successive operations in such form, the yarn is bleached, treated and dried on continuous thread advancing reels, and twisted as it is wound on the bobbin.

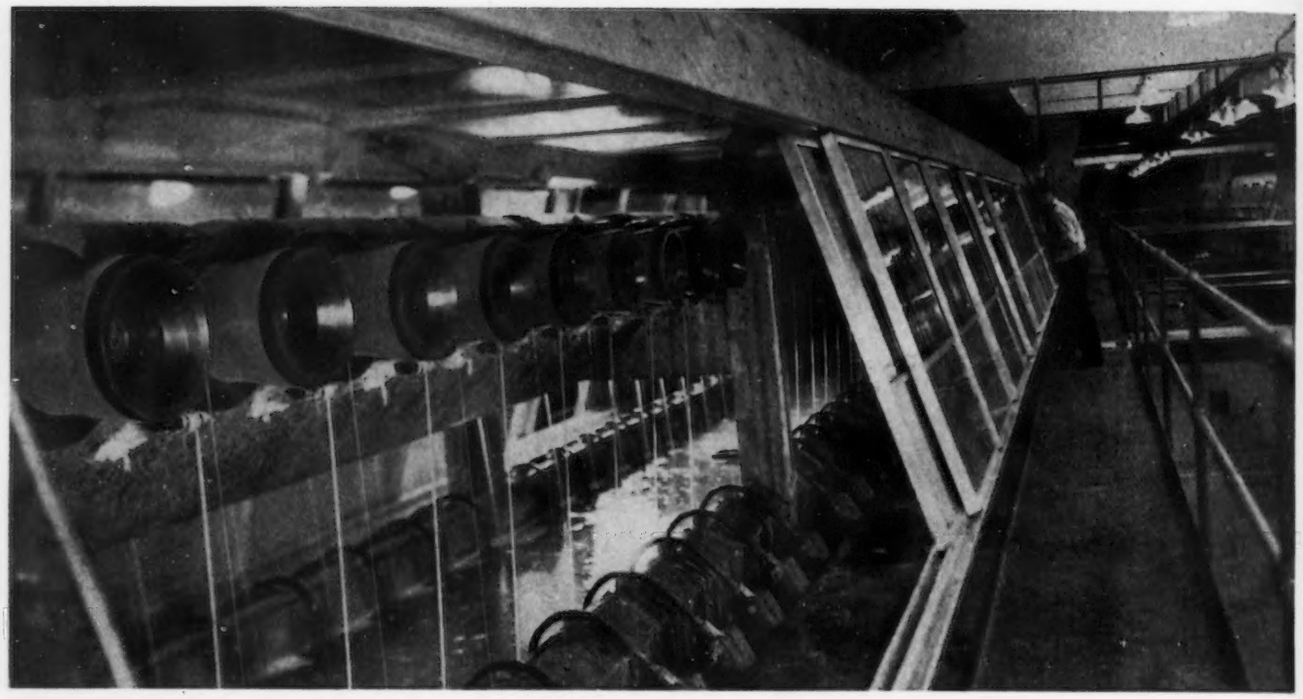
Unlike other reels designed for this or comparable purposes, each reel on these continuous machines is made up of two cages or slat pulleys, set one within the other, and rotated as an overhung assembly. In motion they assume the appearance of a cylinder, but the two members of the reel do not rotate about the same center.

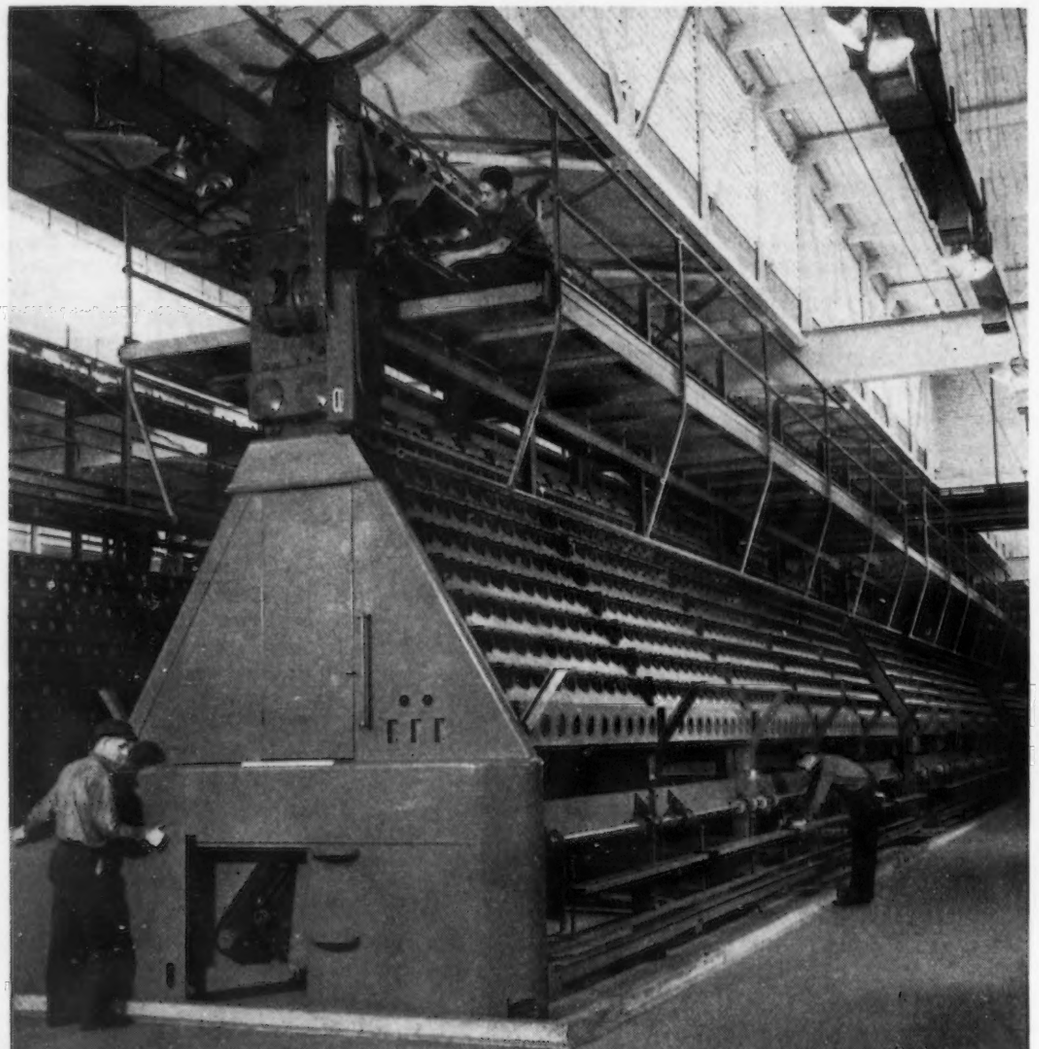
The relation of the cages to each other causes a thread led onto the reel at one end to advance along the bars automatically as the reel rotates, until the thread passes off the outboard and down to the next reel in the sequence.

Moving continuously forward through processing liquids sprayed as the yarn advances on the reels, the rayon thus treated as a single thread winding on each reel has a uniformity of fineness and physical characteristics which, it is claimed, are superior to standards otherwise attainable. Obviously, also, material in process, handling costs and production interruptions are minimized.

The most logical arrangement of combining the rayon spinning and processing stages was to superimpose them, for reasons of compactness and economy of floor space, ease of threading when starting or resuming operations on any position, and for the convenient application of the transmission equipment for driving the various operating mechanisms. To accommodate this general plan, an A-

* Mr. Bergmann and A. F. MacDonald, designing engineer, American Bridge Co., Pittsburgh, were co-authors of a paper "Welded Steel Supporting Structures for Continuous Process Rayon Producing Machines" which received the Fourth Main Award in the James F. Lincoln Arc Welding Foundation competition in the Industry Machinery classification.





ABOVE

FIG. 2—Looking into one of the glass enclosed, lead-lined spin tanks at the top of the machine, showing the spinning reels on which is wound the rayon formed in the tank. Reels are of special design. Four angle take-offs for the spinning reels, two on each side, are provided on each transmission unit.

o o o

AT LEFT

FIG. 1—One of the new continuous spinning machines, completely welded, during installation. Workman at top is installing a gear pump which will serve each of the 100 spinning positions provided on each machine. Reels have not yet been installed on the panels. Workman on the left is removing the panel which encloses the cap twister drive. The principal transmission unit driving all the spinning and processing reels is mounted at the top of the A-frame.

shaped structure, symmetrical about the vertical center line and with three operating levels, was developed.

A common spin trough serves spinning jets pivoted from aprons on both sides. This permits the narrowest and lightest frame believed practical. From this width the machine builds out due to the stepped panels on each side, to the width required by the number of reels in a vertical line to complete the processing and drying. The width at the bottom of the panels determines the width of the twisting machine, where the finished yarn is wound onto bobbins.

Preliminary studies revealed that fabricated and welded steel offered the greatest possibilities for an economical machine frame. The design shown in Fig. 1 was adopted after a thorough analysis of all recommendations and figures submitted by a number of representative fabricators.

The basic design for jig welded structural steel frames and panels was applied under a contract with the American Bridge Co., whose engineers collaborated with those of the Rayon Machinery Corp. to further develop and perfect the design and the necessary fabricating jigs and equipment for accurate checking of the finished work.

Every effort was made to utilize easily obtainable, commercially rolled structural steel sections, as well as conventional fabricating facilities for the preparation of the elements making up the completed parts. Moreover, since the contract covered great numbers of like parts, heavy, rigid, permanent jigs were designed and built in which the parts of the frame members were assembled and accurately held while being welded together.

The intention of the design was to avoid any machining of surfaces after the assembly was welded together and removed from the jigs. The extensive use of flanged bearing housings and adjustably mounted transmissions, which were alined and doweled on erection, eliminated much of the machining originally thought necessary. Except in three parts, the required accuracy was obtained in production without resorting to machining after welding.

Much skepticism had been expressed as to the practicability of securing the required accuracy by jig welding methods. Many felt that distortions caused by the welding would produce inaccuracies after the pieces were removed from the jigs, particularly in the stepped panels for the processing reels.

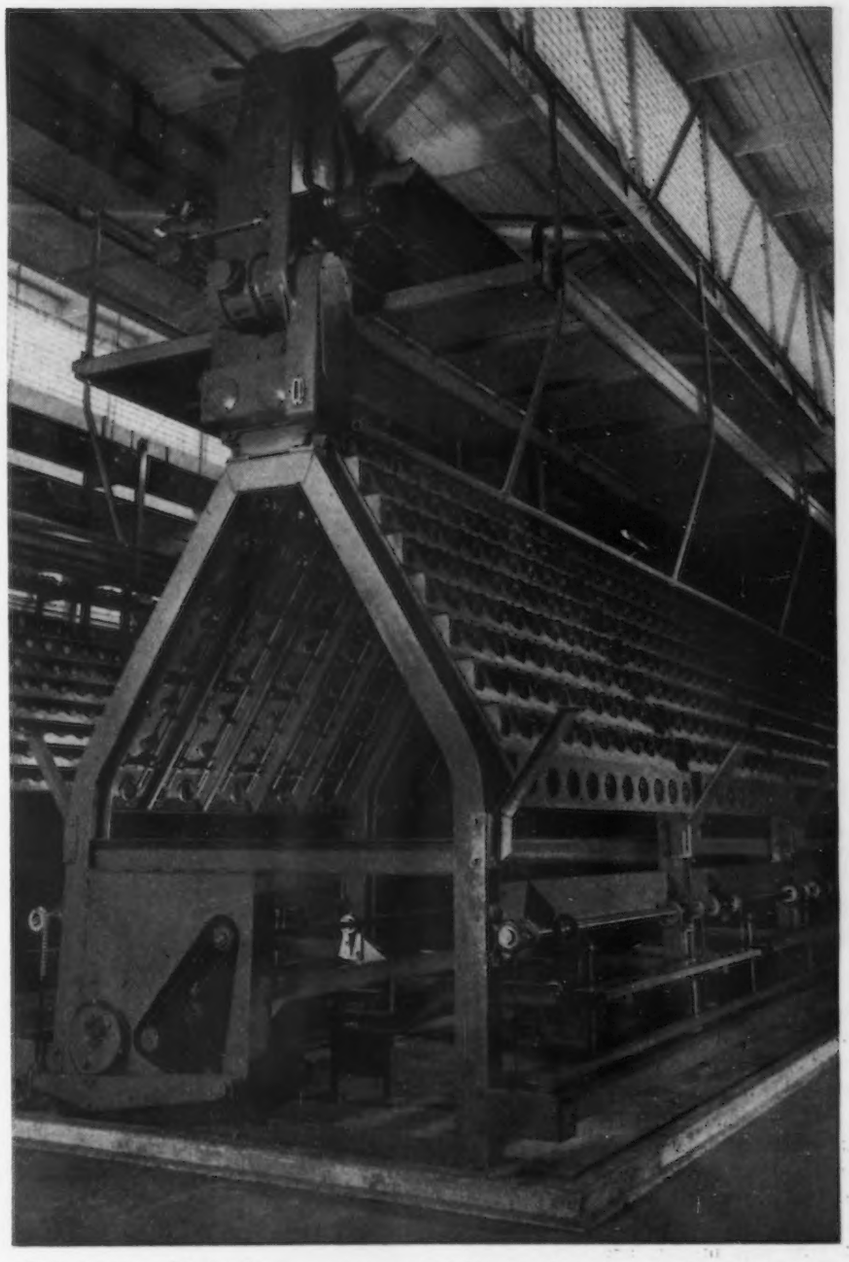
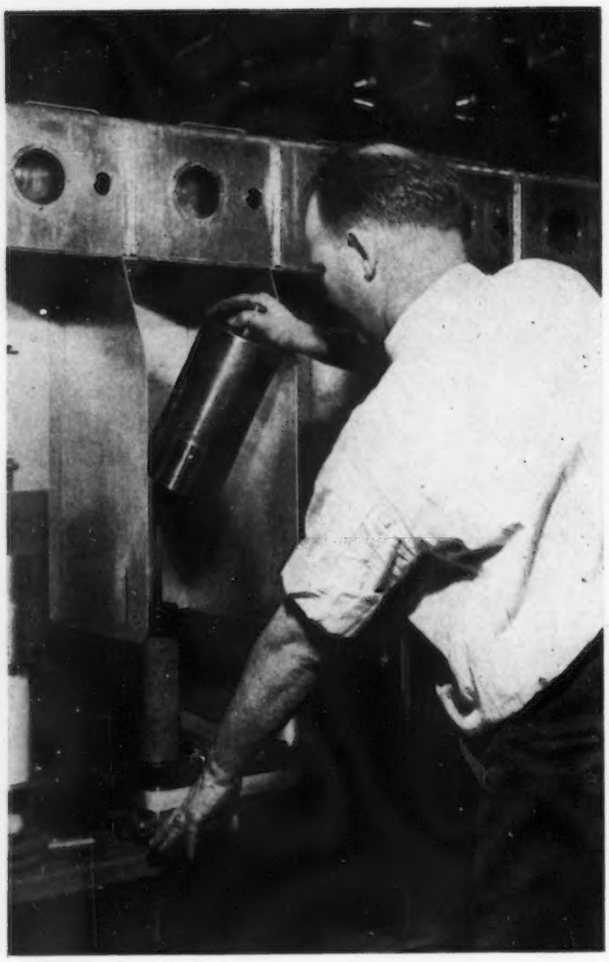


FIG. 3—The welded A-frame, arrangement of drives and process panels, are shown in this picture. At the very top is the drive for the spinning reels, which are driven from a single shaft. On top of the A, are the main drive shafts for the processing and drying reels.

The accuracy and efficiency of the jigs and production methods were checked with experimental sample parts, and with only nominal changes these parts have now all been produced in multiple, demonstrating that the distortions caused by welding were not of sufficient magnitude to interfere with securing the desired accuracy, owing to the production methods used.

The drive end A-frames and similar intermediate frames are made up of bent column sections milled on bottom ends and flame-cut to angle on top ends. Bearing plates were carefully pressed and straightened and jig drilled. All parts were assembled in a jig having fixtures for holding properly to position.

The machinery boxes for the drive end A-frames were made up of commercial plates, bars and rounds, assembled in a jig and welded. All boring and spot facing was done in one setup on a horizontal boring mill. Pads were also milled, to establish



AT LEFT

FIG. 4—The operator is placing a stainless steel cap twister over an empty bobbin on the machine.

o o o

BELOW

FIG. 5 — Duplex silent chain drive and cam mechanism for operating traverse table for cap twisters at the base of the machine.

accurate gage points for supporting the box in the A-frame jig, in which the finished box was then welded to the A-frame.

All elements composing the inclined stepped panels were fabricated from commercially rolled plates or shapes, except the stamped and counterbored cups in which the flanged process and drying reel mounts are fitted. Accurate alinement of these cups was necessary for the proper operation of the bevel gears which drive the reels from an inclined shaft serving each vertical position or series of reels.

Parts were assembled in consecutive order in the welding jig, with auxiliary fixtures holding all parts to accurate positions. These parts were then welded to form a complete frame from which the cups were entirely free, the cups being firmly attached to plugs in the jig base.

Accurate alinement of cups, after welding to the frame, was confirmed by inspection of all panels after completion, special facilities having been designed to produce a marked templet showing the exact location of the axis of each cup counterbore. No machining of the panels after assembling and welding was necessary.

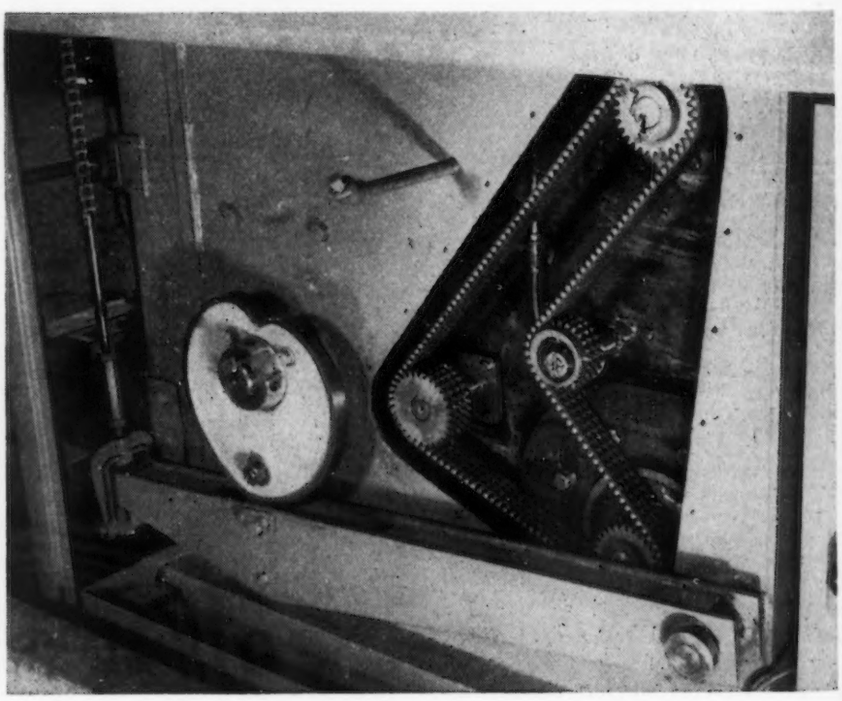
The drive panel for the spin and process drive machinery was made up of structural plates and bars, pre-fabricated and welded in a jig. For the desired accuracy in assembling the several mechanical units on this frame member, the fabricator elected to machine the pads and base after the panel was removed from the welding jig.

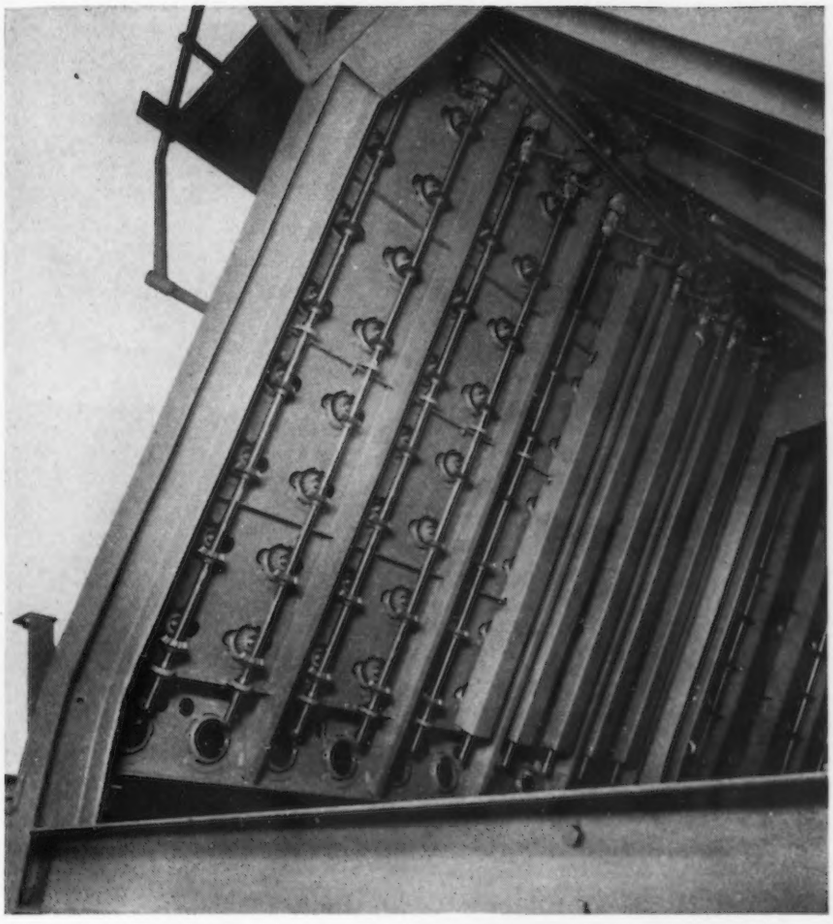
The intermediate frames for the spin machine were made of structural shapes and plates, pre-fabricated and welded in an assembling jig. No machining or other fabrication was necessary after removal from the jig.

While the miscellaneous parts, such as floor supporting brackets and frames, spin aprons, twister cylinder frames, circulating pump bases and liquor feed box frames offer no unusual features, they are interesting examples of economical welded steel construction, making effective use of ordinary sheets, plates, bars and shapes.

Catwalks for operators on the top spin machine are cantilevered from the frame members. The construction is light, economical and simple, but substantial. The floor frame and grating for the operators on the second deck or process section of the machines is supported by brackets attached to the A-frame columns.

The Painesville installation consists





ABOVE

FIG. 6—Closeup view of gears for the processing reels.

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of 96 complete machines, or 48 pairs including the structure for the process liquor distribution system which is mounted between machines. Fig. 3 shows the basic framing, with drive units applied. The total over-all length of the complete frame structure, if the machines were set lengthwise, would be 4500 feet.

Another important application of fabricated and welded steel members was developed in the twister traverse tables. Each machine has 5 such tables, supporting 100 rayon twisting spindles, and the required pulleys for leading the driving tapes or belts to and from the spindles and over the main driving cylinders.

Each series of 5 tables, about 44 feet long over-all, is counterweighted and suspended by pulleys and chains from longitudinal rocker shafts on each side of the machine frame and operated from a cam at the drive end of the machines. The weight of the table made as illustrated, with light, welded steel beams and welded tubing for pulley supporting brackets, is held to a minimum, an important advantage in its operation, since it traverses vertically for winding yarn onto the bobbins.

Sheet steel closures and guards provide a finished appearance to the machines, as well as safety to operators and maintenance mechanics. Design treatment conforms with modern practice throughout. For the spin bath, processing sections, and cabinets serving the drying reels, an impressive total of sheet aluminum fabrication was also involved.

Welded steel tubing also came in for generous use in some of the ma-

o o o

BELOW

FIG. 7—Inside the A-frame of the continuous spinning machine developed by Industrial Rayon Corp. The operator is checking flow of hot water through dryer reels at the base of the processing section. Water supply and return manifolds are shown below the snap-on closures concealing the reel gears.

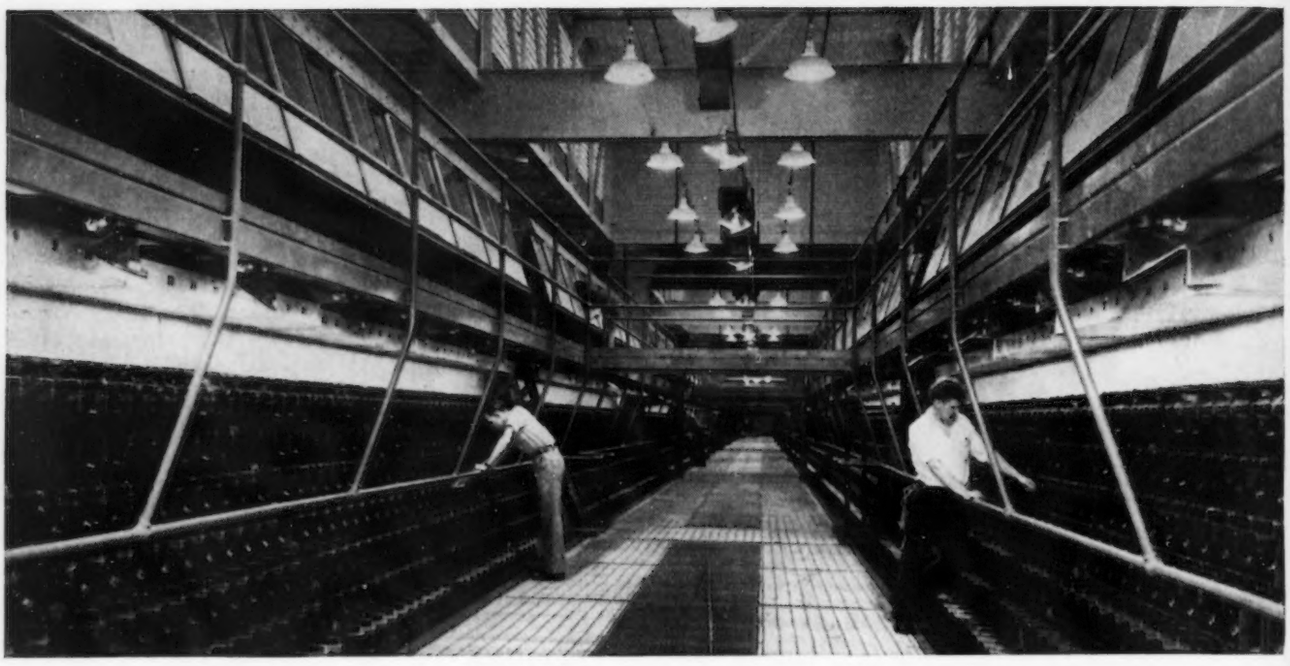


FIG. 8—Looking through one of the second-tier processing aisles at Painesville.

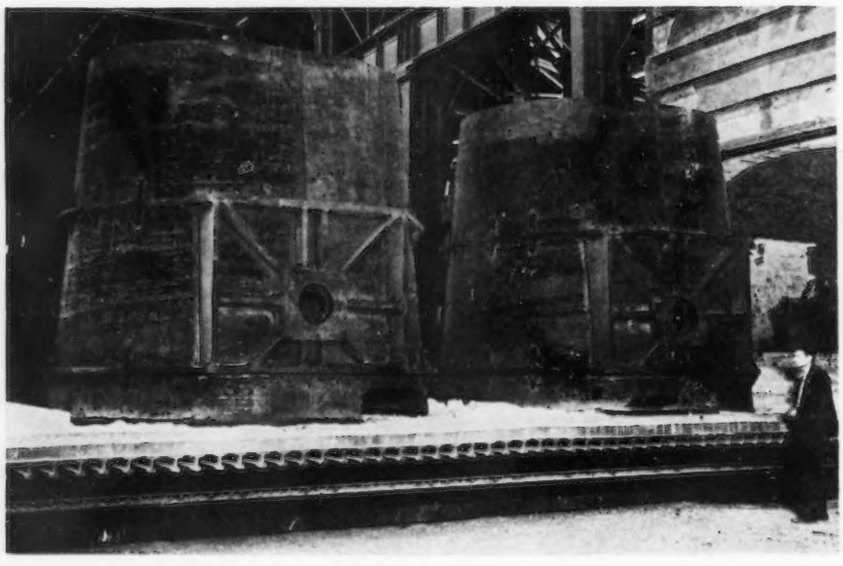
chine elements. The most outstanding example is the twister cap, made entirely of welded steel tubing with stainless skirts, as illustrated in Fig. 4.

Motors are flange mounted on castings for duplex or back type silent chain drives to the several elements served by each motor. Chain tensions are maintained by spring-backed automatic idlers mounted on studs set in the casings. Force feed lubrication from an oil sump in the bottom of each casing is provided for all chain drives, details of which are shown in Fig. 5.

The installation also included many special worm and helical gear transmissions, for the distribution of power to each system of reels. Several thousand gear boxes were required for driving each series of reels from the main line shafting through the machines. Fig. 6 shows the gears for the processing reels. Reel gears are concealed by snap-on closures as shown in Fig. 7.

Steel shafting was ground and polished, and straightened to tolerances which prevented any serious runout on spiral and bevel gears.

In all, the installation represents probably the most general use of a diversified line of steel products to be found in any recent textile plant. Modern design, fabricating, welding and production methods are accredited with much of the commercial possibilities now recognized and put into effect.



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TWO welded ladles recently made at the Bethlehem Steel Co.'s Bethlehem plant shown emerging from a heat treating furnace.

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PULVERIZED COAL

By C. F. HERINGTON
Engineer, Amsler-Morton Co., Pittsburgh

FOR firing metallurgical furnaces, pulverized coal went through its heyday in 1915-25. The many difficulties of that period resulted from inexperience, but persistent engineering has so lifted efficiency that the fuel warrants careful consideration for new or revamped furnace installations.

PULVERIZED coal as a fuel has distinct advantages for various kinds of heating operations. Therefore, in view of the constant demand for increased economies in industrial furnace heating, it is most desirable to have a proper appraisal of industrial fuels so that an intelligent selection of the most appropriate source of heat energy for a given service may be readily made.

Many industrial operations are initiated or completed by the burning of gas, fuel oil or coal. Without question the current cost of fuel is important, but also of importance is the question of long range availability and the dependability of coal as a low-cost source of supply. Most furnaces may properly be adapted to utilize pulverized coal efficiently; and when the coal is properly distributed for burning at the furnace, it becomes a very desirable industrial fuel. An ideal luminous flame is produced which surpasses in efficiency many other fuels.

The early use of pulverized coal was accompanied by problems long since solved, such as (1) incomplete drying of the coal, (2) poor pulverization, (3) lack of suitable burners, (4) improper furnace design, (5) faulty methods of distribution, and (6) lack of dependable preparatory machinery. Within the past ten years, all of these difficulties have been minimized. The new and rapidly increasing use and interest in this fuel is an indication that pulverized coal is as reliable as any fuel.

The earliest use of pulverized coal was in the cement industry, and

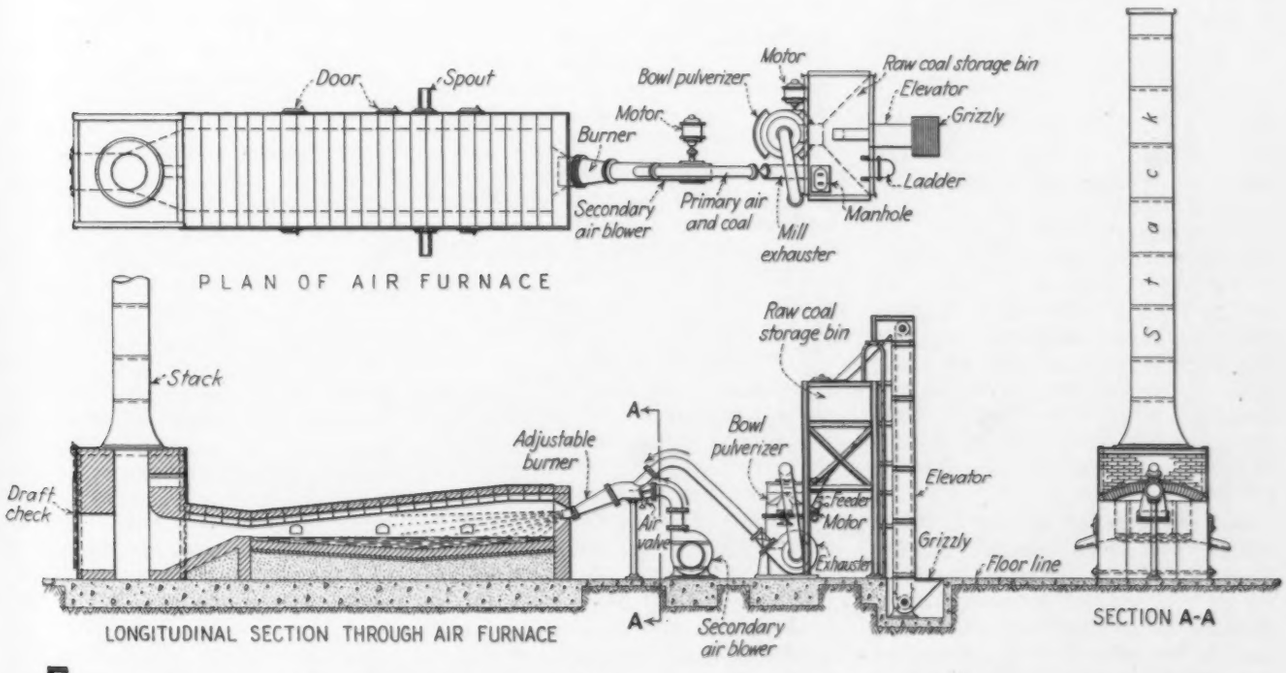


FIG. 1—Unit system for a malleable iron melting furnace, with separate air blower for the pulverized coal.

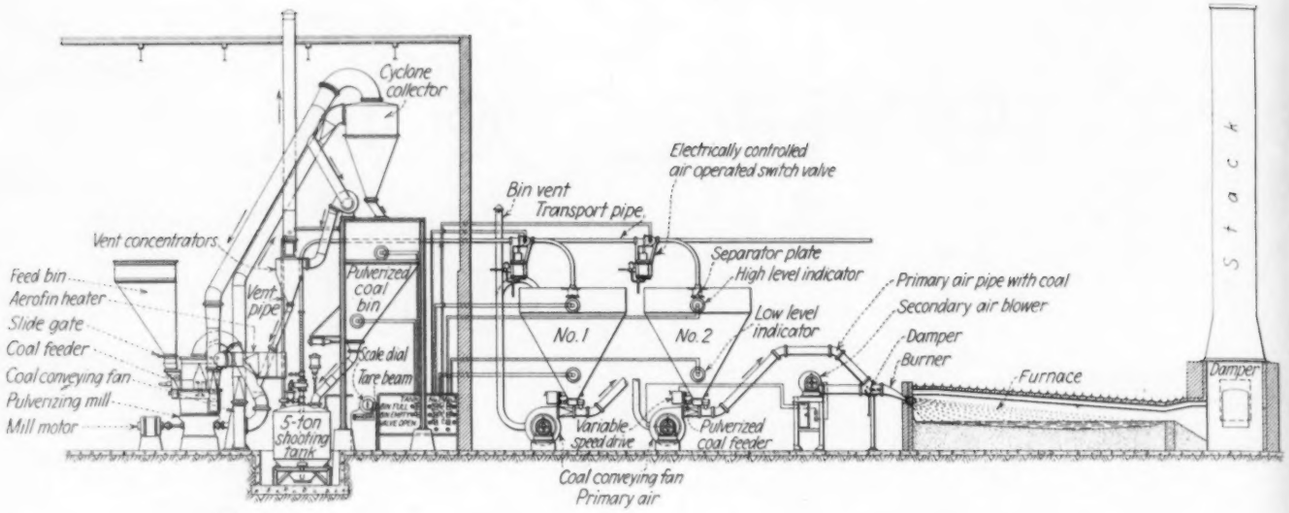


FIG. 2—A combination central and unit system for utilizing pulverized coal.

Messrs. Hurry and Seaman are entitled to the credit in 1895 of establishing pulverized coal as a fuel at the Atlas Portland Cement Co., Hudson, N. Y. Its use has never been discontinued at that plant. Today, practically 95 per cent of the cement made in this country is fired with this type of fuel.

Because, at its inception, the cement industry jealously guarded the processes of manufacture as valuable secrets, it was not until about 1900 that the procedure of burning pulverized coal became generally known.

In the earlier stages of furnishing pulverized coal equipment, it was claimed that the proper way to measure efficiency was on a B.t.u. basis. In other words, for a furnace performing a certain heating operation using 20 gal. of fuel oil per hr., each gallon of oil containing 140,000 B.t.u., there would be consumed 2,800,000 B.t.u. of energy. On such a basis it would require 2,800,000 B.t.u. in pulverized coal to perform the same operation, the superior efficiency of the coal arising from the fact that the 2,800,000 B.t.u. in oil would cost more than the same number of B.t.u. in coal. This fact is obvious, for if fuel oil costs 5c. a gal., coal (with 14,000 B.t.u. per lb.) would have to be sold at $10 a ton to give an equivalent cost per B.t.u.

But this type of comparison does not by any means measure the efficiencies of metallurgical furnaces, for the real problem is one of heating cost and not of fuel cost. Pulverized coal, or any other fuel in substitution for what is now in use, should not be chosen for the mere reason that it has a lower B.t.u. cost, but, rather a fuel should be selected which, all things considered, will show the lowest *production* cost under existing conditions in the shop being investigated.

Production costs depend upon three things—the input, the output and the operator—and in no two shops are these three conditions similar. Each shop requires a separate study to determine which fuel will perform with greatest efficiency in certain heating operations.

In order to determine heating furnace efficiency with a new fuel in comparsion with a previous fuel, the following observations should be made:

Start the furnace at room temperature, raise it to a certain final temperature and note the comparative times for traversing this temperature interval for both fuels.

Then take the furnace, at the temperature of the room, and place therein the charge material at the same temperature, and raise both the furnace and the charge to a certain final temperature. Note the time consumed in this operation for the two fuels being investigated.

Lastly, start the charged furnace at the temperature of the room (or at any desired temperature) and operate the furnace in the regular manner. Note how many pounds of material are raised to a predetermined temperature and the number of pounds of coal, oil or the amount of gas consumed in order to reach this figure.

Unless the new fuel shows better results in these three tests, it is not more efficient. If pulverized coal, tried out in this manner, does not produce effects superior to those fuels formerly used, it is not more efficient.

Type of Installation

At this point the question will arise as to the reasons why pulverized coal is not more generally applied, especially in view of the fact that its use in boiler firing is constantly increasing. During the years 1915 to 1925, pulverized coal was used extensively in metallurgical furnaces of all kinds, chiefly because it proved to be a much cheaper fuel per ton of output than any other fuel in use at that time. This fuel was used in the following heating operations: Annealing ovens, bar heating furnaces, box sheet annealing, car wheel furnaces, anode furnaces, bolt and nut furnaces, billet furnaces, air furnaces, bloom furnaces, continuous furnaces, copper billet furnaces, copper reverberatory furnaces, open hearths, shovel welding furnaces, wheel heating furnaces, forge furnaces, rivet making furnaces, tire heating furnaces, zinc furnaces, rotary coal dryers, and tin smelting furnaces.

The source of most of the difficulties encountered during the 1915-1925 period lay in the fact that many equipment manufacturers scrambled to install pulverized coal on furnaces and reduce fuel costs, without understanding even the fundamentals of the heating operations involved in the substitution of the fuels. In most cases the equipment was sold and delivered to the purchaser and left for him to erect and place in successful operation. True, a supervising engineer was furnished to erect the equipment and another engineer to start the equipment, both of whom had the opportunity to

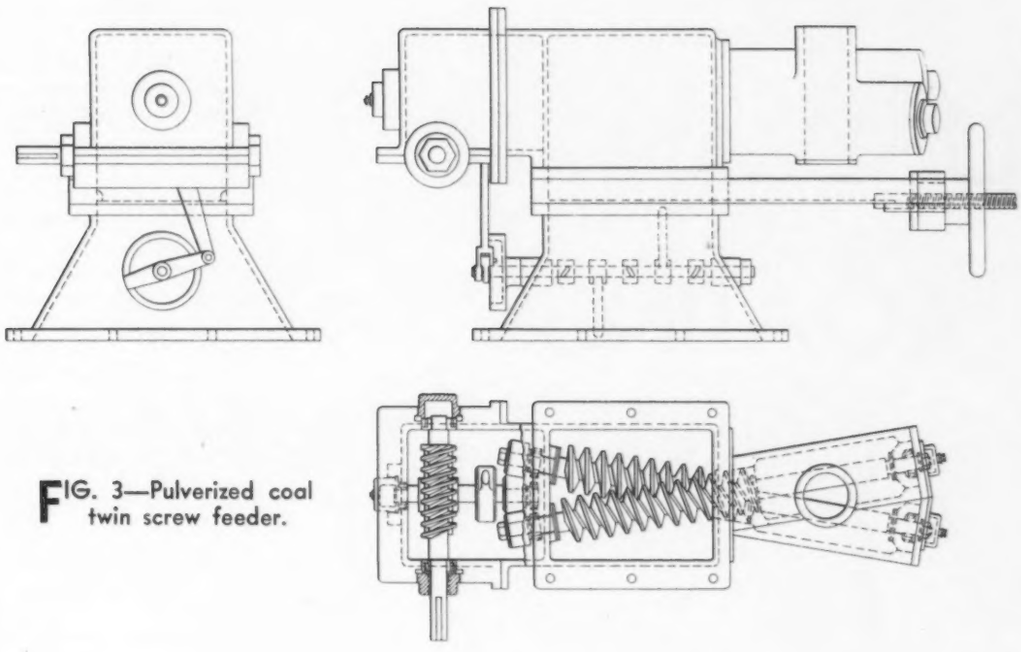


FIG. 3—Pulverized coal twin screw feeder.

learn with the purchaser what it was all about. This practice gradually tended to eliminate the problems arising from inexperience.

The ash problem at first seemed an obstacle. One steel man estimated that with coal containing 10 per cent ash and with his annual coal tonnage replacing fuel oil, it would be only a period of ten years before the city's inhabitants would be walking the streets in a deposit of ashes 6 in. deep.

While it is true that about 40 per cent of the non-organic solids in the coal are discharged through the stack of a pulverized coal installation, it is also true that these solids will be of such small size, because of the pulverization, that they will be carried miles away from the stack even in a still atmosphere.

This fly-ash is white or light gray and free from unburned carbon, and will not be any more detrimental than the many tons of dust normally carried around in the cleanest atmosphere. The best evidence of the lack of ash trouble is found at Ford's power plant at River Rouge, where 1800 tons of pulverized coal are consumed every 24 hr. day. If this coal contains 5 per cent ash, there would be deposited about one-fourth of the ash content of the coal leaving the stacks, or about 22 tons of ash each day. However, careful observations made within a radius of 12 miles have failed to reveal any ash deposit.

Also in Cleveland, all of the public utility power plants use pulverized coal and there has been no serious complaint of ash nuisance as far as can be learned.

A dust fall of 1000 tons per square mile per year seems large, yet it would take 100 years to build up a deposit of one inch. Of course there have been many discussions as to the detriment of the ash falling and sticking on the charge material, and this point was well taken in the earlier uses of pulverized coal because no one knew how to eliminate the nuisance.

A few years ago the question of supplying pulverized coal to a copper refining furnace was delayed for fear of ash depositing on a copper bath containing 99.95 per cent Cu. A burner was designed that delivered the fuel at such a velocity that the ash particles were carried a distance of 50 ft. over the bath and deposited in the uptake of the waste gas boiler. This burner was not of complicated design —it consisting only of a round pipe flattened out at the discharge end.

Different Systems

Original pulverized coal firing systems may be designated as falling into two groups, the central system and the unit system.

The central system consists of four divisions, (1) the receiving, crushing, and conveying of the raw coal, (2) the drying, pulverization, and storage of the pulverized coal, (3) the delivery of the coal to the furnaces, and (4) the firing equipment. In this system all of the first three divisions of the work are carried out in a building called the central coal plant. This plant is placed in control of an operator who is made responsible for furnishing the fuel required for all of the heating operations.

The unit system eliminates the central coal plant and requires the delivery of the raw coal from the point of supply to each of the furnaces. At the furnace unit pulverizers are placed which grind and deliver the coal directly into the furnace at each of the furnaces.

The main disadvantages in the unit system are: (1) difficulty in maintaining a uniform fire due to variations in the amount of coal delivered to and by the pulverizer, and especially in the variable fineness of pulverization, (2) absence of fuel storage, and (3) furnace delays due to mechanical or electrical trouble.

This system has no place where continuous heating is required, or where fluctuations in the amount of coal are necessary because of variations in tonnages handled by the furnace. A lowering of coal volume results in an excess of primary air and causes a very lean mixture which in turn produces an unstable flame. If the amount of primary air is cut down to give a richer mixture at lighter loads the velocity may fall to the point where the flame will work back into the burner or coal may lodge in the pipe.

With the unit system, there is also required complete duplication of parts at each point of application and the added inconvenience of raw coal

(CONTINUED ON PAGE 57)

GALVANIZED COATINGS

By F. L. WOLF[1] and W. E. RENWICK[1]

THE data given in this paper are the result of an investigation to determine satisfactory methods for measuring weight and uniformity of hot galvanized coatings on castings and forgings. A number of existing methods were investigated, keeping in mind the need of a practical test which could be performed in the field and factory. Due to the fact that it was found impractical to control the weight and uniformity of coating on hot dip galvanized castings and forgings of intricate shapes, effort was turned to develop the use of a uniformity test to supplement visual inspection. The Preece test, after refinement and standardizing of manipulation, was found to be the most practical test available, for a check on uniformity of coating.

SATISFACTORY methods, to date, have not been developed to measure the weight and uniformity of coating on hot dip galvanized castings or forgings. The A.S.T.M. Standard Method, A90-33[2], specifically states its use for galvanized iron or steel sheets and wire. This method describes stripping tests which are supposed to be suitable for testing zinc coated articles and which have been found unsatisfactory for hot dip galvanized castings and forgings.

To review the subject quickly, consider that hot dip galvanizing refers to a method of applying a protective coat of zinc to metals. Clean metals are immersed in a bath of molten zinc, at a temperature of approximately 100 deg. above the melting point of zinc, allowed to reach the temperature of the bath and then withdrawn. A continuous film of zinc is retained on the surfaces of the articles.

The thickness of coatings is dependent upon the temperature of the galvanizing bath and upon the method used to remove the excess zinc. Material which is galvanized by the hand dip method will have a thicker coat than if galvanized by the centrifuge method. Some shapes do not lend

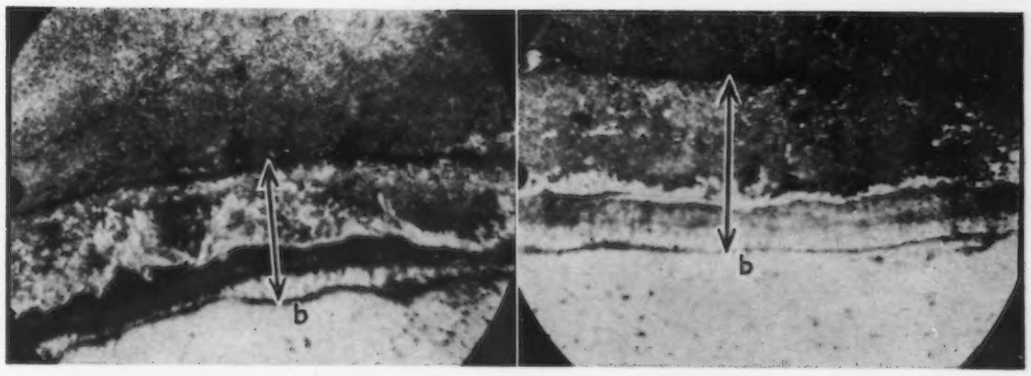
[1] Technical director and test engineer respectively, Ohio Brass Co., Mansfield, Ohio.

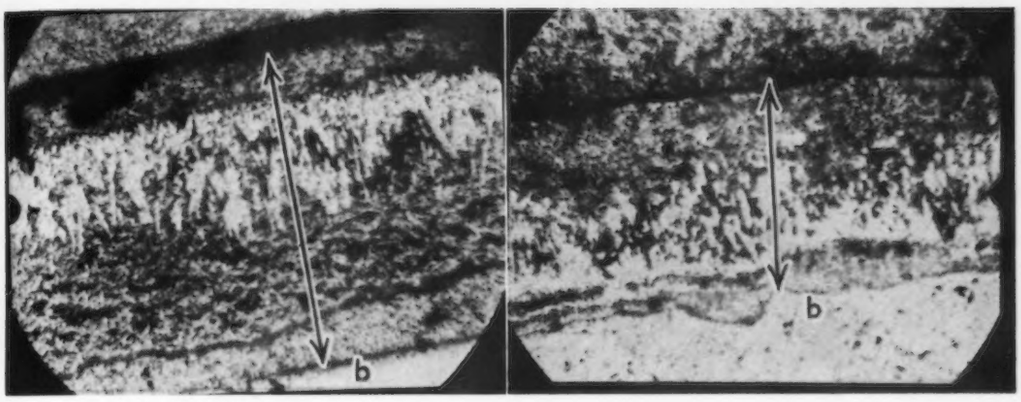
[2] Standard Methods of Determining Weight and Uniformity of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles, Designation: A90-33, American Society for Testing Materials, 1936, Part I, p. 397.

FIG. 1 — Objects having such irregular shapes as these go through many galvanizing plants. It is impractical to control the weight and uniformity of the zinc coatings on work of this type.

AT RIGHT

FIG. 2—Steel forging hot dip galvanized by centrifuge method (left) and by hand dip method (right). Micrographs at 500 diameters after etching with one per cent iodine. Arrow indicates coating thickness and (b) is the base steel.





AT LEFT

FIG. 3—Malleable iron casting hot dip galvanized by hand dip (left) and by centrifuge (right) methods. Micrographs at 500 diameters after etching with one per cent iodine. Arrows indicate coating thickness and (b) is base iron.

themselves to the hand dip method and are therefore handled by the basket or centrifuge machine methods.

Uniformity of coating depends upon the method used to distribute the liquid zinc on the surface of the article before solidification. To some extent, uniformity is affected by the design of an article: for instance, the zinc coat will be thinner on sharp corners and small radii than on flat or uniform surfaces.

A.S.T.M. Tentative Specification, AI53-33T[3], places a minimum limit on the weight of coating on gray iron, malleable iron and steel castings of 1.60 oz. per sq. ft. and 1.85 oz. per sq. ft. for rolled, pressed and forged articles. The author's experience has been that the weight and uniformity of coating, for such articles of irregular shape, cannot be controlled by practical manufacturing processes. See Fig. 1 for examples of shapes.

A cross-section of a hot dip galvanized coating will reveal a complex structure when examined under a microscope[4,5]. Next to the iron base material will be found a layer of zinc-iron alloy over which can be seen a layer of zinc conforming to the composition of the galvanizing bath. Figs. 2 and 3 show typical details of structure as may be found on hot dip galvanized coatings on malleable iron castings and steel forgings. These metallographic specimens were mounted in pure zinc for polishing. The base metal, marked "b", is at the bottom of the photomicrographs and the thickness of coating is indicated by the arrows. The alloy layers of the sections shown in these micrographs are divided into from two to four distinct layers.

Carefully controlled tests[6] have shown that the life of zinc coatings in atmospheric exposure is totally dependent upon the weight of coating, including the alloy layer. It has also been shown that coatings of zinc afford two kinds of protection to ferrous materials, (1) a seal from the weather by a continuous envelope of metal, and (2) a resistance to the corrosion of small bare areas due to either the products of corrosion of the nearby zinc or to an electro-chemical protection.

Fig. 4 shows a view of the Ohio Brass Co. atmospheric exposure rack located on the roof of a three story building in an industrial community and near a crossing of two main line railroads. On the near end of the rack are many specimens of hot dip galvanized castings and forgings which have been continuously exposed for more than 20 years and do not show the corrosion of exposed iron.

Testing Methods

It is desirable to know the thickness of zinc coatings on materials as a measure of its protective value. Where it is practical to control the thickness, such as on sheet and wire, the consumer is charged for this added protection and he should have some means of checking the quality of his purchase.

A survey of the existing methods for determining the weight of zinc coatings[7] on materials leads to the conclusion that there are no satisfactory test methods for hot dip galvanized castings and forgings of intricate shapes. The average weight of

[3] Tentative Specifications for Zinc Coating (Hot Dip) on Hardware and Fastenings, Designation: A153-33T, American Society for Testing Materials, Tentative Standards, 1936, p. 185.

[4] Henry S. Rawdon, "Structure of Commercial Zinc Coatings", Proceedings, A.S.T.M., Vol. 18, Part I, p. 216 (1918).

[5] William H. Finkeldey, "The Microstructure of Zinc Coatings", Proceedings, A.S.T.M., Vol. 26, Part II, p. 304 (1926).

[6] C. L. Hippensteel, C. W. Bergman and F. F. Farnsworth, "Some Observations on the Outdoor Atmospheric Corrosion of Protective Zinc Coatings", Proceedings, A.S.T.M., Vol. 30, Part II, p. 456 (1930).

[7] L. Kenworthy, "The Methods of Testing Zinc Coatings", Journal of the Institute of Metals, Vol. LXI, 1937, p. 225.

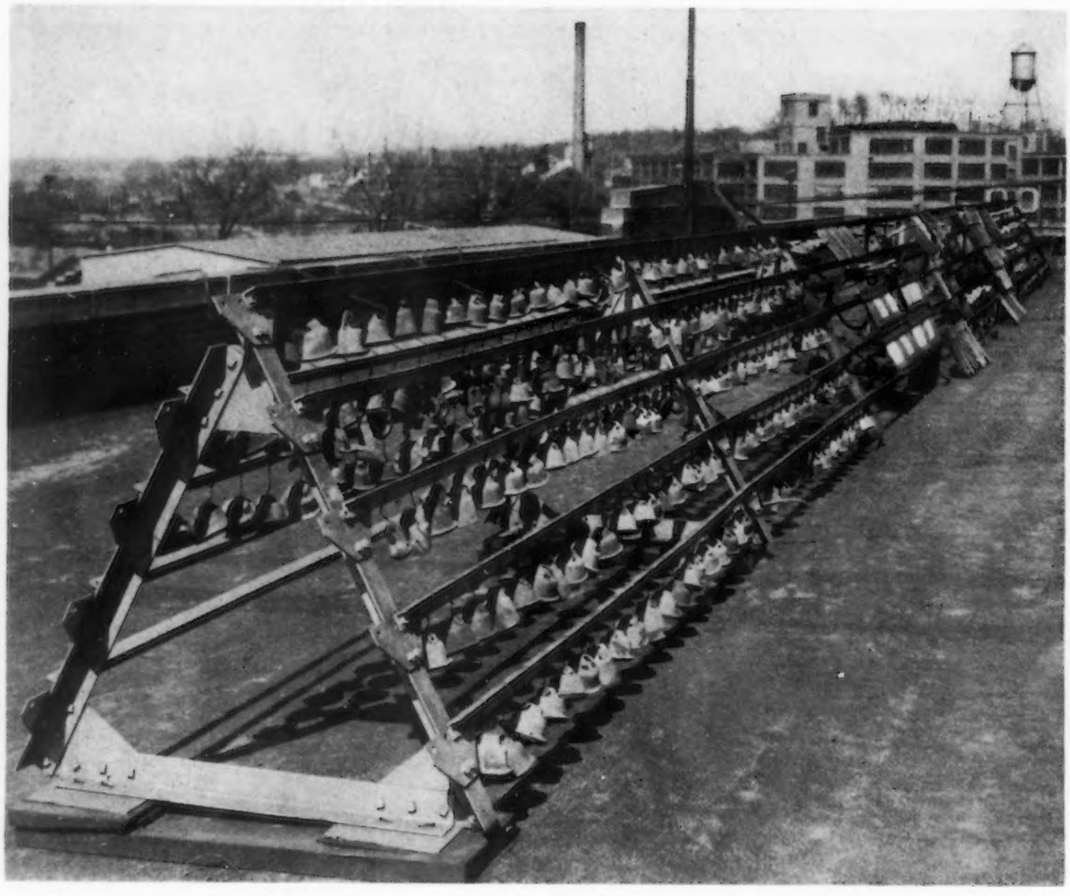


FIG. 4 — Atmospheric corrosion rack for the long-time testing of galvanized coatings in an industrial community. Some specimens at the near end, hot dipped castings and forgings, show no corrosion of exposed iron after continuous exposure of 20 years.

coating can be accurately determined on such material during the process of manufacture if the investigator has the patience to calculate or measure the surface area over which the zinc is distributed. There is a distinct need for some sort of indestructive test which does not require the use of expensive apparatus or an expertly trained operator.

Uniformity tests are desirable as a measure of the quality of the protective coat. Quality is also checked by visual inspection. Castings which have shrinks and cracks near the surface and castings which are not clean will not cover in the galvanizing process, and can easily be detected. Abnormal variations in thickness of coat can be segregated by visual inspection.

The determination of uniformity is a measure of the thinnest parts of the coating on an article. Uniformity is usually measured by stripping the coat and measuring the time when the base metal is exposed at the thinnest places. Chemical methods of dissolving the coating are not satisfactory for coatings composed of different alloy layers because the rates of dissolution vary.

In the authors' experience with hot dip galvanized castings in atmospheric exposure, any material which can pass a visual inspection will unquestionably possess a satisfactory weight and uniformity of coating.

A study of weight and uniformity of coating has been made on castings hot dip galvanized by both the hand and centrifuge methods. The weight of coating was determined by careful weight measurements made on the specimens before and after galvanizing. Thickness of coat was determined from many micrometer measurements made on numerous specimens. A resume of the data is given in Table I. The key letters on the sample numbers indicate coating procedure, that is (a) hand dip, as cast; (b) hand dip, machined surfaces; (c) centrifuge, as cast. The thickness of coating could not be measured on the last two groups of

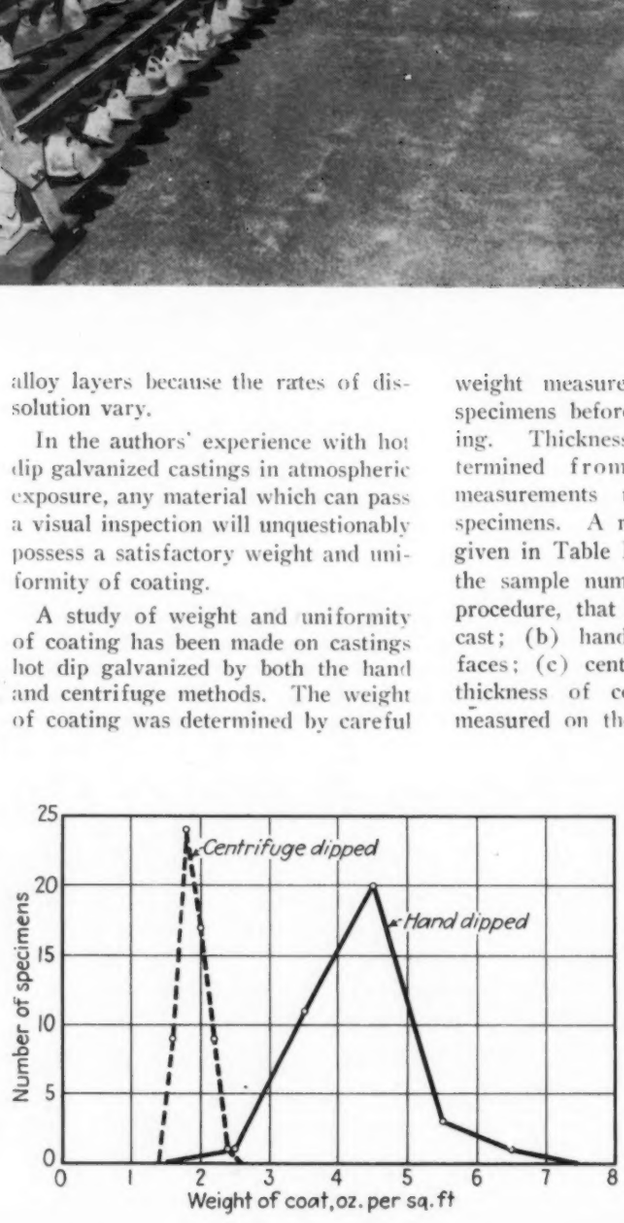


FIG. 5—Frequency distribution of the measurements of coating weights on many hot dip galvanized castings.

specimens because of their intricate shapes.

Fig. 5 indicates graphically the frequency distribution of the data in Table I after excluding the data on the 100 specimens galvanized by the centrifuge method.

Variation in Protection

It has long been known that zinc affords a different kind of protection to iron when in intimate contact with it. This protection is explained by the difference in solution pressure between the metals in an electrolyte. The metal having the greater solution pressure will dissolve first and will, within limits, prevent corrosion of the other metal. Many investigators have demonstrated this protective action of metals but, so far as the authors know, none has measured the extent of the influence. This quality of hot dip galvanized coatings on malleable iron and steel which have been subjected to atmospheric exposure has often been noticed.

Many experiments have been performed in an attempt to determine the limiting area of bare iron which will not rust when the adjacent protective coating is zinc applied by the hot dip method. The relative protective value of the various common metals with respect to malleable iron was first investigated. Bare malleable iron coupons 3/8 x 2¼ x 8⅞ in. were drilled with a series of holes on the centerline of their length and plugged with various commercially pure metals of the electrochemical series. The size of the holes and plugs began at ¼ in. diameter and decreased in size by 1/32-in. increments to 1/16 in. diameter. Periodic inspections were made during an atmospheric exposure test of 536 days. Since it is very difficult to show the extent of corrosion photographically, an attempt will be made to describe their appearance.

PLATE PLUGGED WITH MAGNESIUM: Surface of plugs depressed below the level of the iron. Severe corrosion of the magnesium plugs. Ring of influence[8] on the malleable iron around the plugs, 1/16 to 3/32 in.

PLATE PLUGGED WITH ALUMINUM: Surface of the plugs very slightly depressed below the level of the iron surface. Products of corrosion of the aluminum plugs are dark in color. There is no visible evidence of protection on the iron.

PLATE PLUGGED WITH ZINC: Surface of the plugs very slightly depressed below the level of the iron plate. Plugs were discolored. Ring of influence on the iron around the plugs, 1/16 to ⅛ in.

PLATE PLUGGED WITH CADMIUM: Surface of plugs about level with the surface of the iron plate. Plugs were discolored. Ring of influence on the iron around the plugs, 1/32 to 1/16 in.

PLATE PLUGGED WITH NICKEL: Surface of the plugs about level with the surface of the iron plate. Plugs were discolored. No ring of influence on the iron about the plugs.

PLATE PLUGGED WITH TIN: Surface of the plugs slightly higher than surface of the iron plate. Plugs were discolored. No ring of influence on the iron.

PLATE PLUGGED WITH LEAD: Surface of the ¼ in. diameter and the 7/32 in. diameter plugs are about 1/64 in. higher than the surface of the iron plate. The remainder of the plugs are approximately level with the surface of the iron plate. Plugs were discolored. No ring of influence about the plugs on the iron.

PLATE PLUGGED WITH COPPER: Surface of the plugs about level with the

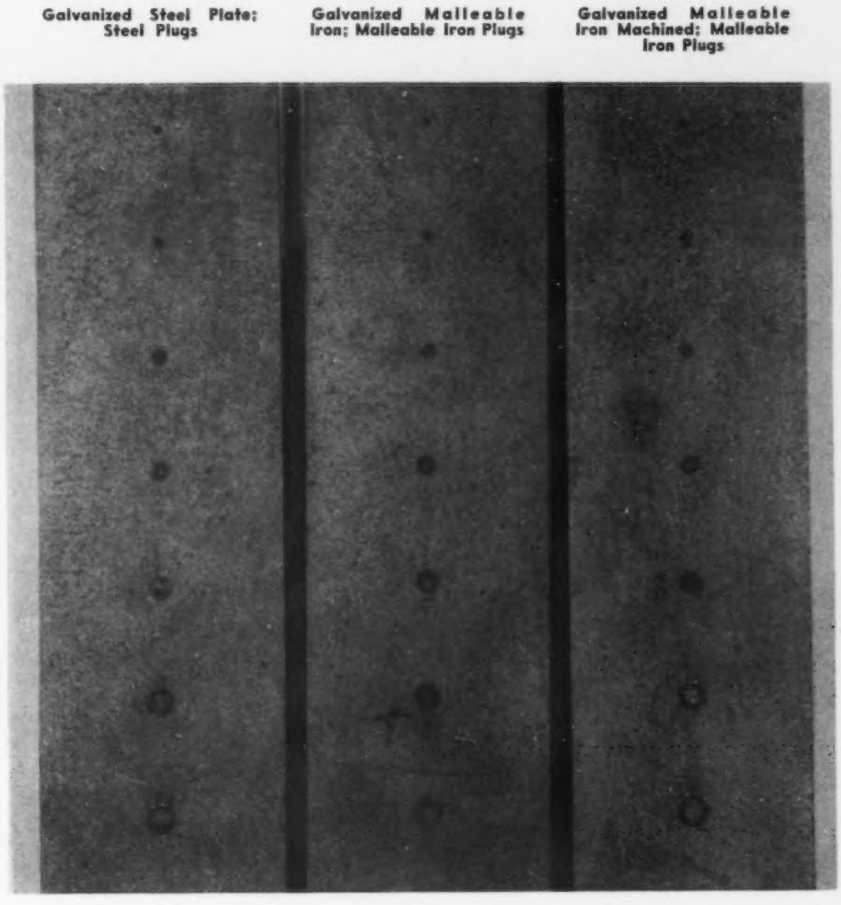

Galvanized Steel Plate; Steel Plugs
Galvanized Malleable Iron; Malleable Iron Plugs
Galvanized Malleable Iron Machined; Malleable Iron Plugs

FIG. 6—To study the protective value of a zinc coating for various areas of exposed iron, these three galvanized plates were drilled with different size holes, and these holes plugged tightly with the base metal. The tests showed that corrosion is unlikely if exposed areas do not exceed the equivalent of a ⅛-in. circle.

[8] Ring of influence means an apparent resistance to corrosion of the malleable iron coupon around the metal plug.

TABLE I

Weight and Uniformity of Galvanizing on Castings

Sample No.	Average Surface Area, Sq. Ft.	Weight of Coating, Oz. per Sq. Ft.			Thickness of Coating on Side, Inch.		
		Max.	Min.	Ave.	Max.	Min.	Ave.
18 H[a]	0.3134	6.40	2.94	4.19	0.0121	0.0039	0.0069
18 H[b]	0.3036	5.17	3.18	4.21	0.0090	0.0050	0.0076
100 C[c]	0.214	3.26	1.27	1.84			
60 C[c]	0.035	2.33	1.48	1.89			

surface of the iron plate. Plugs were discolored. No ring of influence about the plugs on the iron.

PLATE PLUGGED WITH BISMUTH: Surface of the plugs about level with the surface of the iron plate. Plugs were discolored. No ring of influence about the plugs on the iron.

These tests demonstrated that magnesium, zinc and cadmium offer a protection to bare malleable iron when in intimate contact with it. The ring of influence about plugs offering protection to the iron was noticeably wider on the lower side of the plugs (plate exposed at an angle of 60 deg. from the horizontal) which suggests that some protection may have been afforded by the products of corrosion of the plugs.

To study the limiting area which a hot dip galvanized coating will protect bare areas of malleable iron and steel, many experiments were conducted. Malleable iron and mild steel plates (⅜x2¼x8⅞in.) were used for these studies. These plates were hot dip galvanized by the hand method in a commercial galvanizing tank and bare areas of iron exposed by three different methods.

Specially ground drills, from No. 60 to ¼ in. diameter, were prepared so that the bottom of the holes would be flat instead of conical. Holes were drilled thru the zinc to a depth just exposing the iron. The plates were periodically inspected during atmospheric exposure and the observations at the end of 307 days are recorded in the following paragraphs.

PLATE No. 4, as-cast, galvanized malleable iron. Bare iron exposed by holes of No. 60, 1/16 in., 3/32 in. and ⅛ in. diameter show only a very light corrosion in the form of a dark stain or tarnish. Iron exposed by holes of 5/32 in., 3/16 in., 7/32 in. and ¼ in. diameter show a heavy red oxide in the center surrounded by a ring of dark tarnish. The area of the heavy red oxide increases with the diameter of the bare iron exposed.

PLATE No. 8, as-cast, galvanized malleable iron. Bare iron exposed by holes of No. 60 and 1/16 in. diameter show no heavy red iron oxide and all larger holes show varying degrees of rust as in No. 4 plate.

PLATE No. 14, machined malleable iron galvanized. Same as plate No. 8 except that red iron oxide deposits are heavier.

The evidence revealed by these plates was promising but somewhat irregular. This was due to two variables entering into the machining operation which were difficult to control. First, the machinist was unable to measure the depth of the hole accurately and in several cases the purpose was defeated by the bottom of the hole being drilled too deep into the iron plate. This withdrew the test area from contact with the zinc coating. Second, the method of drilling was such as to possibly force some zinc into the test area, resulting in false protected regions.

In an effort to overcome the above inaccuracy, another set of plates was prepared. Grooves of various widths were planed across the width of the plates, and at a slight angle with the plate surface, so that at some point in the slot, bare iron was exposed. These plates were exposed to atmospheric corrosion for 300 days and show some very interesting results.

PLATE No. 2, as-cast, galvanized malleable iron. No heavy red iron oxide on slots 1/32 in., 1/16 in., 3/32 in. and ⅛ in. wide. Bare iron appears tarnished. The quantity of rust on wider slots increases with the width of exposed iron.

PLATE No. 21, machined malleable iron galvanized. Same as plate No. 2.

The plates indicate clearly that adjacent zinc has a definite influence on the corrosion of bare iron areas of not more than 1/16 in. from the zinc. To further substantiate this evidence three more plates which had been galvanized were prepared, drilled through with various size holes and then plugged with unprotected iron of the same composition. The plugs were pressed into the plates and made level with the zinc coating. Fig. 6 is a photograph of these plates after 82 days exposure. These specimens have since been exposed to the weather for a total of 935 days, and the appearance of the plugs has not changed appreciably since the photograph was taken.

PLATE No. 1, galvanized machine steel plate with bare machine steel plugs. The plug of 1/16 in. diameter is lightly tarnished, 3/32 in. diameter plug is lightly tarnished, ⅛ in. diameter plug shows a 0.1 mm. protected rim with a tarnished center, 5/32 in. diameter plug shows a 0,3 mm. protected rim with a rust center, 3/16 in. diameter plug shows from 0.0 to 1.3 mm. tarnished rim with a heavy rust and white salt deposit center, 7/32 in. diameter plug shows a 0.6 mm. tarnished rim with a heavy rust center with white salt deposit, ¼ in. diameter plug shows a 0.6 to 1.2 mm. tarnished rim with a heavy rust center and white salt deposit.

PLATE No. 5, as-cast, galvanized malleable iron plate with bare malleable iron plugs. The plug 1/16 in. in diameter shows tarnish only, 3/32 in. diameter plug shows a 0.2 mm. tarnished rim with a lightly rusted center, ⅛ in. diameter plug shows a 0.1 mm. lightly tarnished rim with a heavy rust center, 5/32 in. diameter plug shows a 1.0 mm. lightly rusted rim with a heavy rusted center and some white salt deposit, 3/16 in. diameter plug shows a 0.6 to 1.2 mm. tarnished rim with a heavy rust center with white salt deposit, 7/32 in. diameter plug shows a gradually increasing quantity of rust from rim to center with some white salt deposit. ¼ in. diameter plug is the same as the 7/32 in. diameter plug except it has more white salts.

PLATE No. 16, machined malleable iron, galvanized, with bare malleable iron plugs. The plug 1/16 in. in diameter shows a 0.2 mm. tarnished rim with a lightly rusted center, 3/32 in. diameter plug shows a tarnish all over, ⅛ in. diameter plug shows a 0.1 to 0.2 mm. lightly tarnished rim with a tarnished center of a deeper color, 5/32 in. diameter plug shows a tarnished rim which gradually increased to a rusty center, 3/16 in. diameter plug shows a 0.5 to 1.4 mm. tarnished rim with a heavy rust center and some white salt deposit, 7/32 in. diameter plug shows a 1.0 mm. tarnished rim with a heavy rust center and white salt deposit, ¼ in. diameter plug shows a 0.7 mm. tarnished rim with a heavy rust center and a white salt deposit.

The results of these tests lead to the conclusion that bare areas of iron surrounded by hot dip galvanized coatings are unlikely to rust when such areas do not exceed that of a ⅛ in. diameter circle.

For those who wish to make some kind of a check on visual inspection, no test available seems more practical than the Preece test.

Use and Interpretation

The Preece test as described in the Appendix of A.S.T.M. Standard Method, Designation: A90-33[8] must be be regarded as incomplete in light of the two very comprehensive studies by H. H. Walkup and E. C. Groesbeck[9, 10]. Some of the important

[9] H. H. Walkup and E. C. Groesbeck, "Some Factors Affecting the Preece Test for Zinc Coatings", Proceedings, Am. Soc. Testing Mats., Vol. 32, Part II, p. 453 (1932).

[10] H. H. Walkup and E. C. Groesbeck, "Preece Test for Zinc Coatings", Bureau of Standards Journal of Research, Vol. 12, No. 6, June, 1934, p. 786.

variables which must be controlled in the manipulation of the Preece test are: preparation of the specimens, composition of the solution, specific gravity and pH value of the solution, temperature of the solution and specimens, and agitation of the solution during the test.

As a result of long study on the protection afforded by zinc coatings surrounding small bare areas of ferrous base metals, the authors have come to the conclusion that it is very unlikely that rust will appear on bare areas up to ⅛ in. in diameter. It seems reasonable, then, to assume that the appearance of bright adherent copper to iron in the Preece test should not be called the end point of the test, until such copper deposits reach the area equivalent to ⅛ in. in diameter circle.

Subcommittee VII of A.S.T.M. Committee A-5 on Corrosion of Iron and Steel has submitted a tentative Preece test method (A208-38T) incorporating the control of factors recognized as essential in the proper manipulation of the test. It is believed that such a method will soften the criticism of the Preece test and render it less erratic and more workable. It is hoped that some test may be devised that will satisfactorily measure the weight of coating on hot dip galvanized castings and forgings of intricate shapes.

Conclusion

(1) There are no satisfactory methods for measuring the weight and uniformity of coating on castings and forgings of irregular shapes.

(2) The weight and uniformity of coating on such articles cannot be controlled in the manufacturing process, but tests show that even the thinnest coats offer ample protection against atmospheric corrosion.

(3) Evidence has been shown that corrosion is unlikely to occur to bare areas of malleable iron and mild steel surrounded by hot dip galvanized coatings when such areas do not exceed the equivalent to a ⅛ in. circle.

(4) It is recommended that weight of coating tests not be used until better methods are developed which can be used for castings and forgings. Visual inspection offers adequate protection for the purchaser.

(5) A revised tentative Preece test method has been submitted for those who wish to check visual inspection. (A.S.T.M., A208-38T)

The authors gratefully acknowledge the assistance obtained from Messrs. F. J. Sedlak, metallurgist, and H. E. Weidenhamer, chief chemist, of the Ohio Brass Co.

16 New Soaking Pits Installed at Edgar Thompson Works

SIXTEEN new soaking pits, built by Amsler-Morton Co., Pittsburgh, at the Edgar Thompson works of Carnegie-Illinois Steel Corp., Braddock, Pa., will add an estimated 1,800,000 gross tons to the company's annual heating capacity, and comprise the largest slab ingot heating installation in existence. The pits will be used in supplying slabs to the new Irvin works.

Each pit is 15 ft. x 16 ft. x 8 ft. 4 in. deep, having an ingot capacity of 10 ingots 28¼ in. x 38¼ in., or 8 ingots 29¼ in. x 44¼ in. There are three double span automatic cover carriages for manipulating 16 covers, which is a new feature in pit furnace construction. A fourth carriage is retained as a spare. All covers are of the automatic self-sealing type.

Recent Design Advances in Cutters,

BORING tools have been combined with threading chasers in large size collapsible die heads for pipe flange work. A collapsible boring head with solid T-C bits is offered, also a drill chuck with length adjustment. Two new ideas in diamond wheel dressers are illustrated, together with a self-balancing grinding wheel mount. Several new models of portable power tools are presented. New types of wrenches have recently been marketed, including indicating torque types. Among the recent announcements covering gaging equipment is a comparator type of internal measuring machine of wide range.

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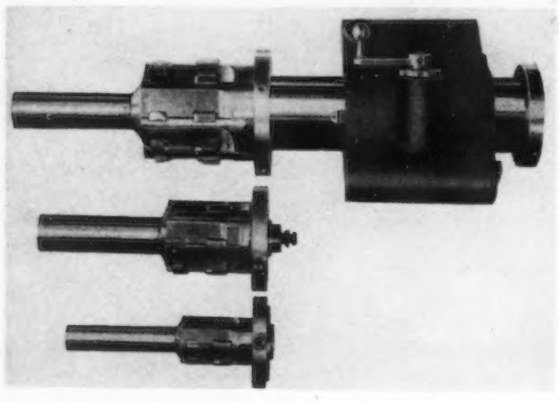
BORING and tapping are combined in a new turret lathe tool developed by the *Landis Machine Co., Inc.*, Waynesboro, Pa. In the style LBSR expanding chaser collapsible tap, which was designated for production work on flanges in a Gisholt Simplimatic or similar machines, a boring and tapping head are mounted in tandem on the tap body to provide for taper boring the hole and tapping the thread in one pass of the tool. A pilot bar attached to the head and fitting a bushing in the machine spindle supports the tap and secures proper alinement with the work.

The expanding action of the style LBSR tap is obtained through a single solid transverse sliding cam, similar to the style LM Landis taps, except that the forward movement of the plunger that produces the expanding action is obtained by reversing the angle on the taper control cam. The latter is arranged for cutting ¾-in. taper per ft. Size adjustment is obtained through a ratchet screw in the front end of the tap, and graduations for thread length are stamped on the body to indicate the corresponding position of the control collar for any thread length, with the boring tools just starting to cut. When the tap is applied to a machine, two draw rods (not shown) connect the cam collar of the tap to a stationary bracket on the bed of the machine. These restrict the forward movement of the collar as the turret is fed forward, thus expanding the tools at the proper rate of taper.



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THE Landis style LBSR expanding chaser collapsible tap combines boring bits with threading chasers for machining pipe flanges on turret lathes. Several sizes of tap heads may be used on one tap body, of which there are two sizes: No. 4, carrying 3 to 5-in. heads, and No. 6 carrying 4 to 12-in. heads.

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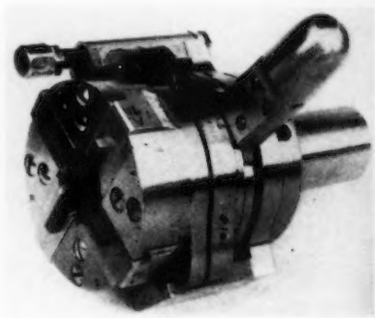
Chaser Die Head for Turret Lathes

A NEW style of H&G insert chaser die head for use on hand screw machines and turret lathes has been developed by the *Eastern Machine Screw Corp.* of New Haven, Conn. This new head uses the same insert chasers as other styles and is made in what is known as 101, 102 and 103 sizes, the latter size having a range from ¼ up to 1¼ in. in long threads and up to 1½ in. diameter in short threads. Drive is by strong torque arms. The head may be tripped either by pull-off or by front end contact, and fine adjustment is provided for length of thread. The shank is detachable and can be furnished in any reasonable diameter, with a clearance hole through it for cutting long threads. The head also has longitudinal float that compensates for variations in starting pressure or turret travel.



A NEW line of H & G insert chaser die heads has been designed for use on hand screw machines and turret lathes.

Carbide Cutting Alloy

A SERIES of hard, strong carbide alloys used for metal-cutting tools, particularly for machining steel, are now being supplied under the name Kennametal by the *McKenna Metals Co.*, Latrobe, Pa. The basic ingredient of the steel cutting grades is a new substance corresponding to the formula $WTiC_2$ and covered by U. S. Patent 2,113,353, granted to Philip M. McKenna on April 5, 1938. Mr. McKenna was at one time research director of Vascoloy-Ramet. This compound produces very fine-grained hard metal

Small Tools and Gages

By FRANK J. OLIVER
Associate Editor, The Iron Age

compositions not subject to grain growth, and hard alloys made from it are said not to crater when cutting steel.

Kennametal is made in three degrees of hardness, as follows:

Grade	Rockwell Hardness C	Trans. Rup. Strength Lb./sq. in.	Thermal Conduct.
KH	78	224,000	0.064
KM	76.5	248,000	0.072
KS	75.6	286,000	0.084

Grade KH is the most widely used grade for machining steel, as well as monel metal, malleable iron, cast irons cutting with a tough, non-crumbling chip, brasses, bronze and aluminum. Grades KM and KS are employed where intermittent cutting and rough machining over blow holes or bolt holes require greater strength of the tool edge. Grade KS can be used for jump cuts on steel and iron castings. Kennametal blanks are furnished in standard sizes for brazing to various kinds of tool shanks.

ESPECIALLY adapted for automotive cylinder boring is a fully automatic collapsible boring head developed by the Wesson Co., 1050 Mt. Elliott Avenue, Detroit. It can also be used for other types of precision boring. The head incorporates two or more bits of solid tungsten carbide. This head is claimed to produce increased accuracy in size, roundness and straightness, better finish and higher production due to the use of increased speeds and feeds possible with double point carbide tools.

Tip Brazing Alloy

EASY-FLO No. 3 brazing alloy is a low temperature brazing alloy having a medium silver content for use in brazing cemented carbide tool tips to shanks. Made by *Handy & Harman*, 82 Fulton Street, New York, this brazing alloy has a flow point of 1270 deg. F. and is available in strip or wire form. It is used in conjunction with Handy flux, which starts to melt and dissolve oxides at 800 deg. With this alloy and flux, tips may be brazed in a controlled atmosphere furnace, a closed muffle type furnace or by a torch. In the latter instance, the heat is applied to the shank from below until it is cherry red (1500 to 1600 deg.)

FEED As You Need Chuck. Drill is held within the body and fed out by means of a screw arrangement, allowing only enough drill to project necessary to go through the drill bushing and work and minimizing drill breakage. This chuck can be adapted also to counterboring and spotfacing. Made by Scully-Jones & Co., 1901 S. Rockwell Street, Chicago.

Abrasive Wheel Mount

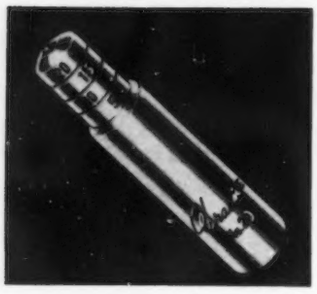
AUTOMATIC self-balancing of grinding wheels is claimed for the Ever-Tru wheel centers made by *Ever-Tru Abrasive Wheels, Inc.*, 145 Hudson Street, New York. The main feature of the mount is a disk made of elastic woven wire mesh of alloy spring steel placed between the wheel proper and the hub. These centers may be used over and over again, with any type of abrasive. Among the claims for this wheel center are: automatic centering and balancing; decreased pressure required because of constant contact between wheel and work; less truing required due to lessened out of round; increased life of wheel, and greater capacity in snagging work and rough work in general.

Wheel Dressing Tools

AN oxide-free process of mounting diamonds for dressing tools has been developed by the *Abrasive Dressing Tool Co.*, 1550 Broadway, Detroit. The new technique, on which patents are pending, involves the heating of the diamonds in a multimetal matrix, without the limitations of a closed furnace. The fusing of the metals around the diamonds is completed in 20 sec., with no chance for the development of metallic oxides. The rapidity of the process also protects the diamonds so that they do not lose their hardness or strength.

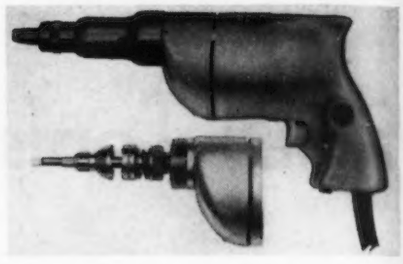
EVER-TRU grinding wheel mounts have an elastic wire mesh insert so as to provide automatic self-balancing on snagging and similar work.

RECRYSTALLIZED diamonds for particular use in dressing grinding wheels are being sold by the *Super Tool Co.*, 21650 Hoover Road, Detroit. Each stone of the Cardimond wheel dressing tool is made from a number of small diamonds fused into a single crystal, indistinguishable from that of a natural black diamond. They have an extremely irregular grain structure, however, which makes them superior to natural diamonds as far as cutting qualities and wear life are concerned. They also have greater resistance to breakage on account of the absence of cleavage lines. According to the maker, these diamonds will dress the widest and hardest types of centerless grinding wheels without measurable loss of size and resultant taper in the face of the wheel. They are said to cut freely and produce a sharp, open surface on the wheel. These Cardimond diamonds are processed in sizes from



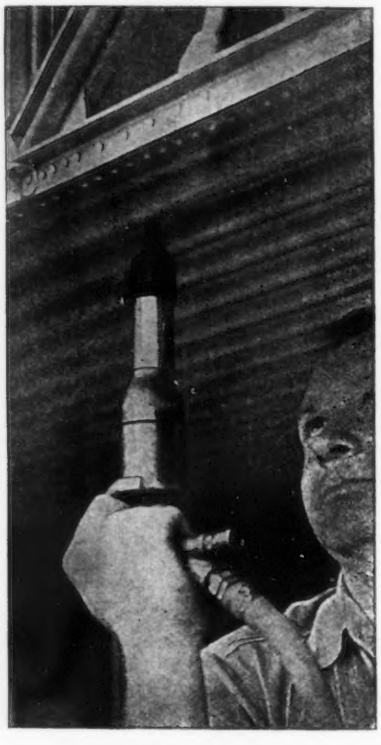
THERE are four layers of five diamonds to the layer, weighing 2½ carats, in the No. 20 cluster type dressing tool for medium size wheels, a product of the Abrasive Dressing Tool Co., Detroit. The method of mounting the diamonds is also new (see text).

SUPER Cardimond wheel dressing diamonds of 1½ carats and larger are single crystals formed from a number of smaller black diamonds.



THE new Van Dorn Scrugun is an electric screwdriver unit with adjustable clutch that can be set to any desired torque. The free spindle idles until operating pressure engages the clutch jaws. Standard no-load spindle speed is 750 r.p.m., and capacity is for screws from Nos. 4 to 12. Overall length, including bit, is 9½ in.; weight, 3¾ lb. One No. 8 bit with finder and sleeve is regularly furnished.

TWO new Victor portable electric drills are announced by the Stanley Electric Tool Division, New Britain, Conn. No. 581 has a chuck capacity of 5/8 in. and No. 341, ¾ in. Both drills have nickel steel gears, heat treated, are full ball bearing, and have combination breast plate and spade handle, with detachable pipe handle. They weigh 19½ and 20½ lb., respectively.



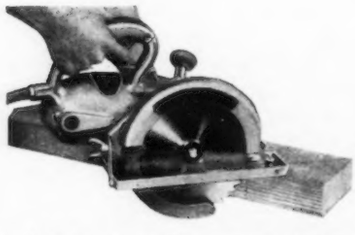
CHICAGO-PNEUMATIC slow hitting, long stroke riveting hammers are especially designed for use in aircraft fabrication. Their easily controlled blows are delivered with the right amount of impact to prevent crystallizing the rivet or marring the metal. Made in sizes to take care of rivets from 3/16 to ¼ in. in either soft iron or aluminum.

THE Compar indicating micrometer and comparator incorporates a light pressure spring to assure constant pressure against the measuring anvils, eliminating "feel" on the part of the operator.

THE new series H Productimeters are made in 20 models and variations for handling of any industrial counting or measuring problem.

J. H. WILLIAMS & CO., 75 Spring Street, New York, have added three new lines of bantam sockets, including extra-deep 12-point sockets, 2 to 2½ in. long and in six sizes from 7/16 to ¾ in.; 8-point sockets, 1½ in. long, in four sizes from 7/16 to 5/8-in. openings; and universal 12-point sockets in the same four sizes. All are designed for use with ratchets and other handles fitted with ¾-in. square drive, and have thin walls for operation in close quarters. The universal sockets operate through a range of 180 deg. and are fitted with spring tension to maintain the selected angle. All are made of heat-treated chrome alloy steel.

A NEW line of heavy-duty box wrenches, made in both double-offset and 15-deg. angle type, with interchangeable tubular handles is announced by Bonney Forge & Tool Works, Allentown, Pa. Each type is made in seven sizes with double hexagon openings ranging from 1 5/8 to 2¼ in. Material is drop-forged chrome alloy steel. The one size of handle is made of seamless steel tubing, 30 in. long.



MODEL A portable electric handsaw, made by Fred W. Wappat, 7319 Penn Avenue, Pittsburgh, has an 8-in. blade with a maximum cutting capacity of 2½ in. Weighs 19 lb. and is said to be well balanced for one-hand operation. Has a telescoping safety guard, also a sawdust guard and blower to keep the cutting line clear. A graduated quadrant is provided for cutting bevels. Power is claimed to be sufficient to cut a 2 x 10-in. wood beam in 2 sec. Unit can be equipped with abrasive disks for cutting other materials than lumber.

BONNEY Zenel TuType wrenches, combining an open-end and box wrench, now are available in a complete range of 13 sizes, from 3/8 to 1 7/16 in. openings. The box end has double hexagon opening and is offset 15 deg. Wrenches are made of drop-forged chrome-vanadium steel, chromium plated.

1½ carats up and come in shapes similar to natural stones. Only a single grade of hardness, toughness and color is produced.

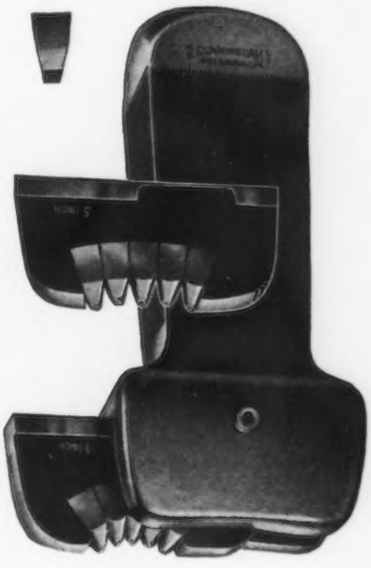
Gaging and Measuring Equipment

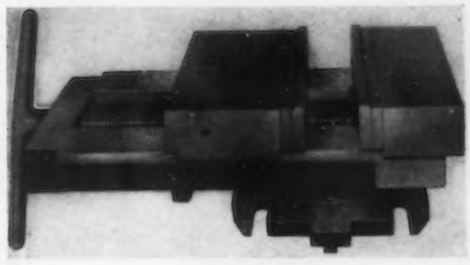
A UNIVERSAL internal measuring machine, with diameter range from ⅝ to 6 in. in the standard model N-2 size, has been placed on the market by *Sheffield Gage Corp.*, Dayton, Ohio. The unit incorporates the basic elements of Sheffield visual gages. Two fingers, each carrying a measuring point and both adjacent to a vertically traveling work rest plate, are combined in an instrument that permits full exploration of a hole at any point within a 1½ in. depth range, so that taper as well as out-of-roundness and comparative size can be checked.

Each of the gaging elements is mounted on frictionless vertical reeds. The so-called fixed gaging point floats on vertical reeds with a fixed relation to the reed pivot that transfers the motion of the adjustable gaging point to the visual gage. Hence, only a variation in the distance between the two gaging elements will vary the indicator reading. Furthermore, there can be gaging pressure only applied on both sides of the hole being checked, regardless of the operator's touch. Since this is a comparative type of instrument, initial readings must be made against a master hole size or precision block setting.

BELOW

M. E. CUNNINGHAM CO., 101 E. Carson Street, Pittsburgh, has recently introduced a new wedge grip radius holder employing interchangeable gear-tooth shaped type for stamping round or curved objects such as pipe and shafts. One set of type and holder can be used on any radius by adopting the proper slide for whatever radius is to be stamped. Stamps and tools are made of non-mushroom safety steel.





ABOVE

THE jaws of this machine vise exert not only an equalized face grip but also a downward pull which automatically levels the work without resort to tamping. The combined action is said not to distort the work. This product of the Kraven Co., 125 Maple Street, Waterbury, Conn., is built to heavy duty specifications and to meet high precision standards of modern production equipment.

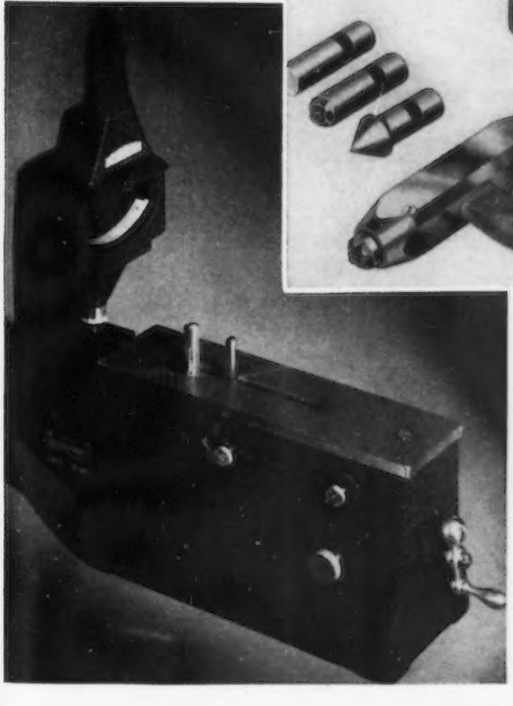
FOR durability and maintained accuracy, a knife-edge lever system is used in place of gears and racks in the indicator mechanism of the improved Compar indicating micrometer and comparator, recently introduced in the United States by the *George Scherr Co., Inc.*, 128 Lafayette Street, New York. There is a relieving button for the lower anvil for use in inserting and removing work. When the button is released, the anvil is pressed against the work by a light pressure return spring, thus eliminating the "feel" of the operator in measuring. Measurements can be made to 0.0001 in. scale reading.

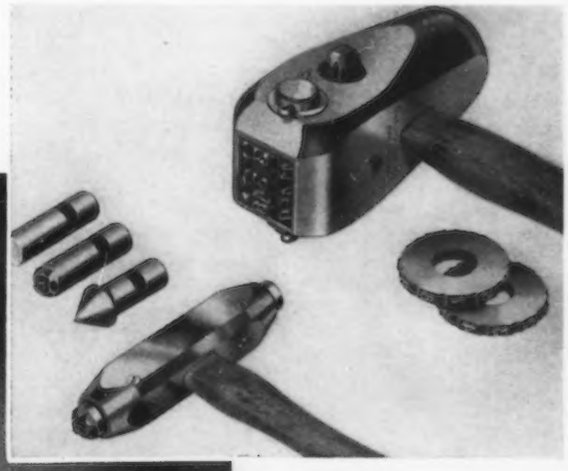
A NEW series of counting machines with modern, streamlined case in gray crackle finish has been placed on the market by *Durant Mfg. Co.*, of Milwaukee and Providence. These series H Productimeters embody oilless bearings and cut gears to insure accuracy over long periods of time. All parts are made of high-grade materials for long life. Visibility has been increased by using metal number wheels with large black figures on a white background.

There are 20 models available: Either stroke or revolution counters may be obtained; non-reset; or with wing nut reset; or tumbler lock reset to prevent tampering with the count. Operating levers or shaft extensions are available on either or both sides. Direction of rotation may be clockwise or counter clockwise. Counters may have either five or six dials.

BELOW

THE new Sheffield model N-2 universal internal measuring machine has a measuring capacity from ⅝ to 6 in. by comparison against a master or precision block setting.





THREE new types of steel stamps and marking devices are announced by Quality Die Co., South Chicago, Ill. The multiple wheel marking device, shown at upper right, is made in two models, one for use as a sledge for stamping hot billets, the other for hand use with a sledge for stamping cold material. Figures or letters are engraved on the wheels, capable of marking metal up to 415 brinell hardness. The mechanism is fully enclosed to prevent damage in rough handling. At lower left is an inspector hammer with changeable heads.

Bridgeport Brass Opens New Rolling Mill

WITH the recent opening of the new rolling mill at its Housatonic Avenue plant, Bridgeport, Conn., the Bridgeport Brass Co., has completed the major part of a comprehensive modernization and expansion program, initiated in 1937.

Built at a cost of $4,500,000, the new mill has a total floor area of some 220,000 sq. ft., which makes it the largest single unit of the 34 major buildings maintained by the company at Bridgeport. It will be devoted to the production of brass, copper and copper-base alloys in sheets, rolls and strips, and will have a production capacity of more than 6,000,000 lb. per month, which is almost double that of the company's previous rolling capacity. The project also includes a separate building that houses the mill offices and all testing, research and development facilities.

In addition to new rolling, annealing, pickling and other equipment of most advanced design, the new mill features straight - line production, which is unique in the non-ferrous metals industry. Materials proceed uninterruptedly in one direction up and down the four main bays, from the first breakdown to final inspection and shipping.

Raw material for rolling comes to the mill in two forms, namely, copper cakes, received by railroad direct from suppliers, and heavy cast alloy bars or slabs, produced in the company's casting shop across the street.

The mill is designed to utilize cast bars to produce materials of standard widths, with multiple slitting to provide any desired combination of widths. This practice facilitates the filling of orders for narrow metal, which pre-

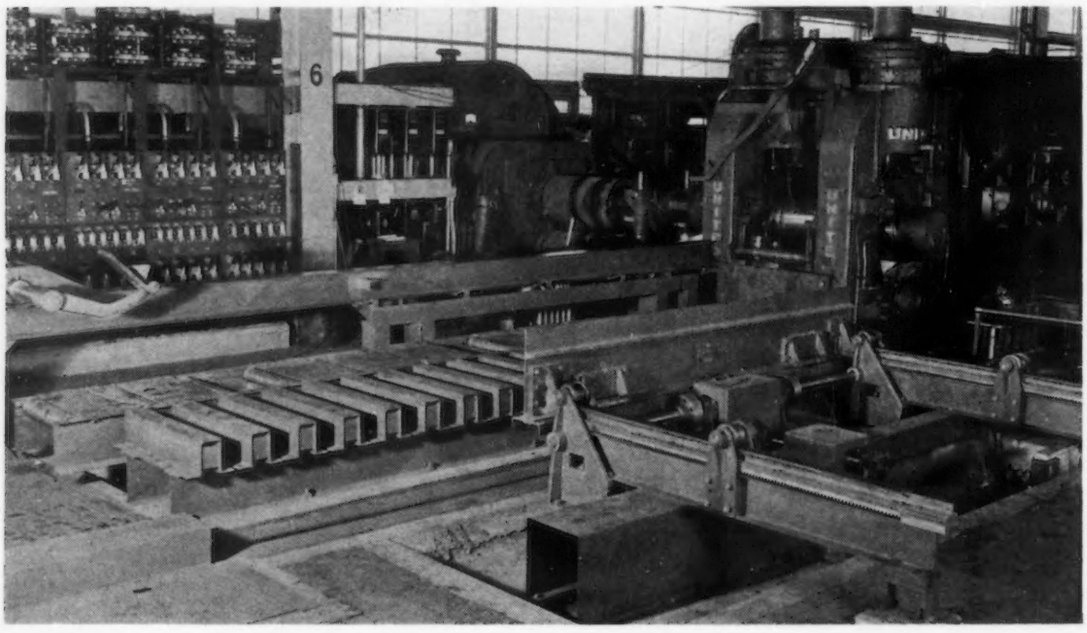


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FIG. 2—Entry side of two-high cold breaking-down mill, showing transfer pusher, transfer table and elevator.

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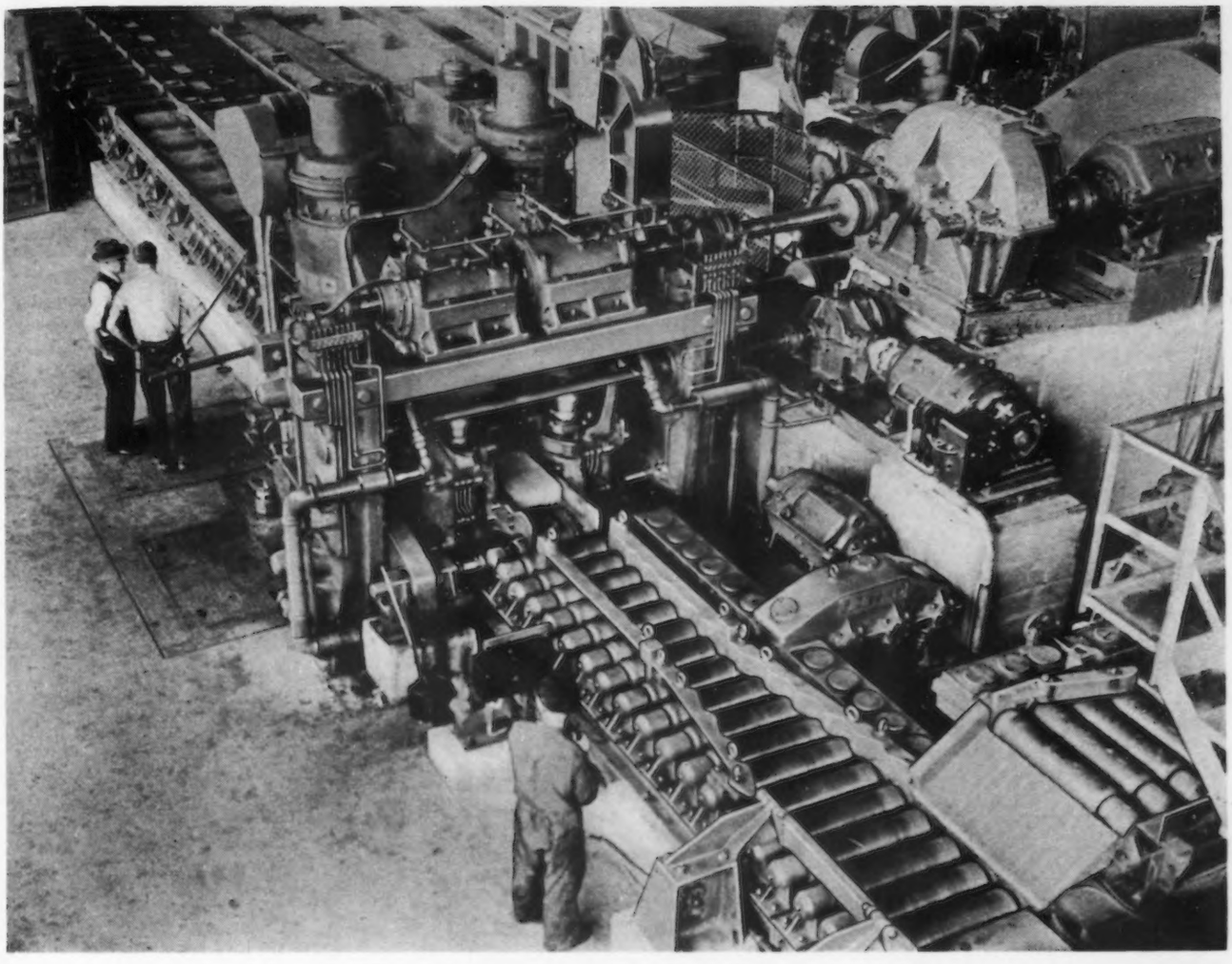

FIG. 1—Universal reversing hot-breaking-down mill, the first unit in the Bridgeport Brass new $4,500,000 rolling mill modernization project. This and the new cold break-down unit and the 4-high tandem intermediate mill were supplied by the United Engineering & Foundry Co.

dominate in most brass mills. For large orders, the standard width sheets are slit as required, while small orders for narrow metal are filled promptly from selvage strips accumulated from previous rolling schedules. In addition to the shortening of deliveries, this practice results in comprehensive production advantages, such as marked reduction in number and cost of molds in the casting shop, reduction in end and slitter scrap, and simplification of mill scheduling and accounting.

Major equipment in the new rolling mill includes:

1—A United two-high universal, reversing-type hot breaking down mill.

2—A United two-high cold breaking down mill.

3—A United two-stand, four-high tandem intermediate mill.

4—Two Bliss four-high, single stand finishing mills.

5—A battery of two-high cold finishing mills, including a new Farrel-Birmingham high-speed unit.

6—Also, cake heating and annealing furnaces and pickling, overhauling, slitting, shearing and handling equipment sufficient to assure coordinated operation of all individual units.

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Cake Heating and Hot Breakdown

First in line in the new plant is the hot breakdown mill (Fig. 1) with its cake heating furnace and other equipment. Copper cakes weighing from 400 to 1000 lb. are delivered to the heating furnace, or in some cases directly to the mill table, by an overhead crane.

The cake heating furnace is of continuous type, oil fired, and is positioned parallel to the mill approach table. Cakes are passed through it on heat-resisting skids in three parallel lines, being first elevated into position by three hydraulically-operated elevators. Charging of the cakes through the furnace is effected by three ram-type pushers controlled from the mill pulpit. The arrangement is such that as a cold cake is fed into the furnace, a heated cake is delivered on to the furnace delivery table. Spring-cushioned bumpers absorb the shock of the cakes as they leave the furnace and pass to the mill approach table, which is at right angles to the furnace table and at a lower level. Automatic temperature control is provided, and each zone is controlled separately to permit efficient operation over a wide range of production.

Passing off the furnace delivery table, the heated cake approaches the hot breakdown mill, the horizontal rolls of which are driven by a 1000-hp. d.c. reversing motor, with Ward-Leonard control, through a reduction gear drive and separate pinion stand.

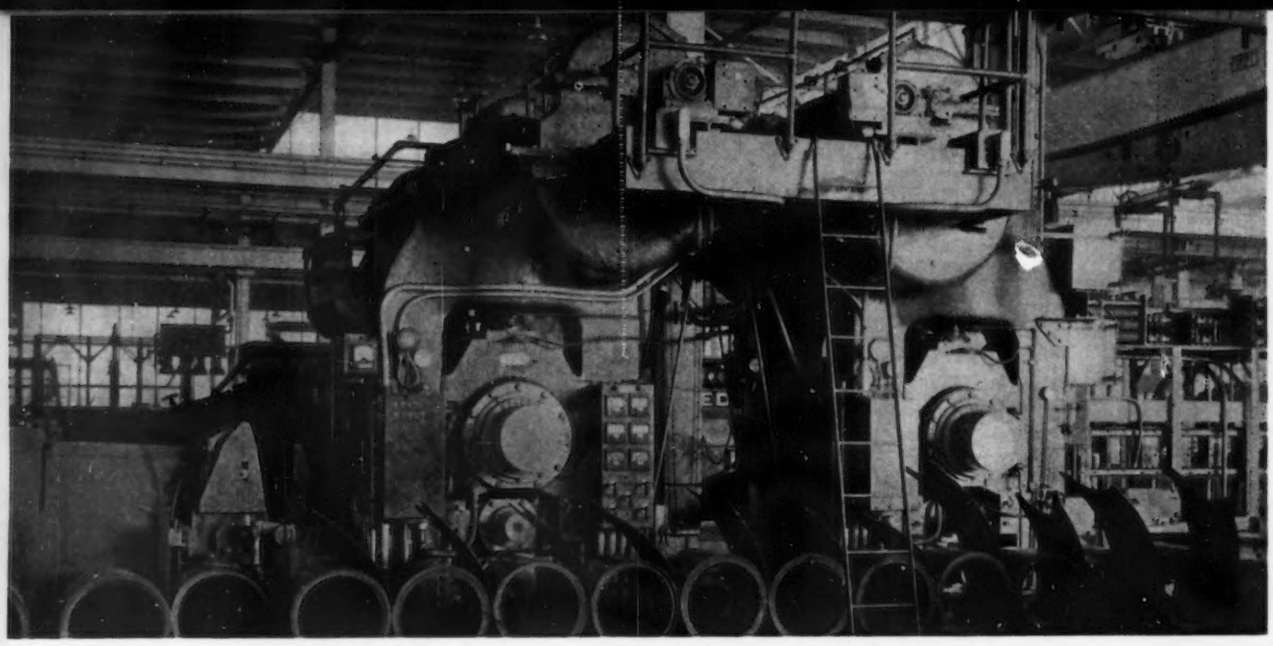


FIG. 3—Full side view of United four-high tandem mill.

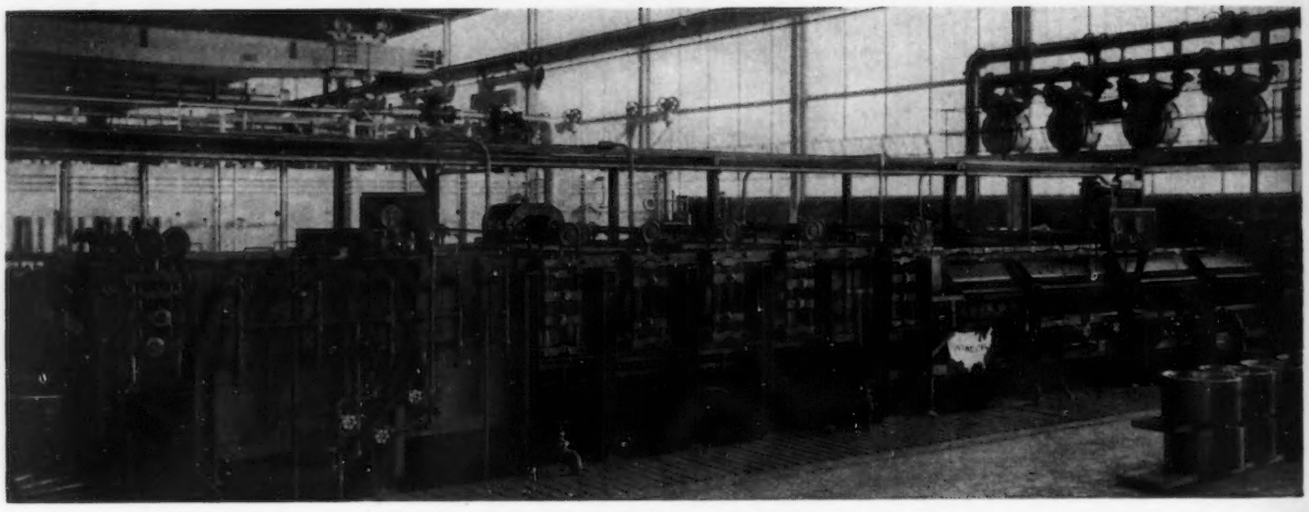
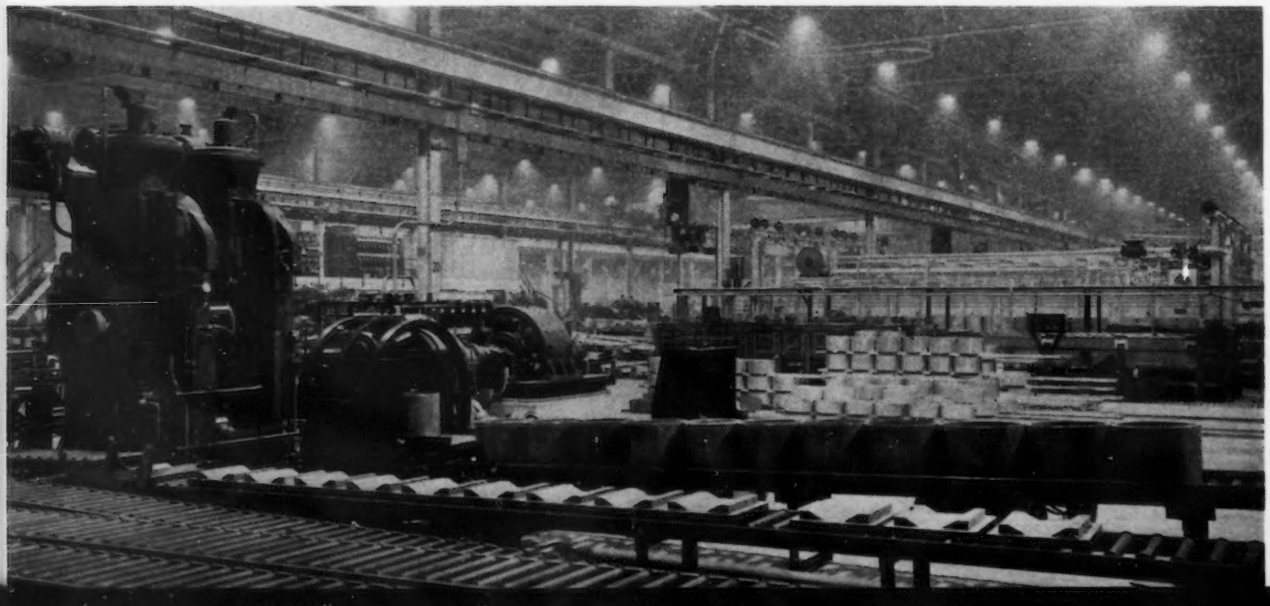


FIG. 4—Continuous pull-through, double-trough pickling units for cleaning coils leaving the run-down annealing furnaces. (Photo by courtesy of Continental Industrial Engineers.)

FIG. 5—Night view of interior of rolling mill. At the left foreground is one of the Bliss mills used for ready-to-finish and finish rolling. The conveyor system to keep the mill in continuous operation is shown in the foreground. Lighting of the mill was engineered by the Benjamin Electric Mfg. Co.



The vertical rolls are driven by a separate reversing motor through a reducing gear set. Controls for both motors are interconnected. The horizontal roll screw-down and the edging rolls are controlled from the mill pulpit and Selsyn indicators are provided to show the exact roll setting.

Front and back mill approach tables are of the same general design as the furnace delivery table and are run by individual motors. The forged steel rollers are driven by inclosed miter gears mounted on roller bearings. Both of these tables are equipped with automatic air-operated side guides. Operation of these guides is hooked up with the reversing pedal of the mill pulpit, an unusual feature.

The runout table of the hot mill is arranged with a cross transfer to the cooling table and bar piler. Beyond this transfer unit there is a United No. 3 vertical, open-side type shear, clutch operated, for cropping the front and back ends of strip to be coiled. Next in line is a motor-driven 3-roll coiler, and a gravity roller conveyor for carrying the coils away from the coiler and at the same time up-ending them. An adjustable chain-type transfer and cooling bed unit is provided for handling and piling the material to be worked in flat bars.

Cold Breaking Down Mill

Cold breaking down is done by a mill (Fig. 2) located near the hot mill but in another bay. It handles slabs weighing upward of 600 lb., which are brought up from the casting shop through an underground passage and stored in a space near the mill until needed.

This cold breakdown unit consists of the mill proper with a combination-type reduction gear and pinion stand, a lifting table equipped with a pneumatic pusher-sticker and an hydraulically-operated transfer pusher on the entry side, a delivery piling table and hydraulically-operated transfer pusher on the delivery side, and a motor-driven transfer car.

After one or more piles of slabs have been placed by overhead crane on the stationary table on the entry side of the mill, they are moved by the transfer-pusher to the lifting table and are raised so that the top bar is in position for entering the mill. The top bar is then pushed off the pile and into the mill rolls by the pusher-sticker. With the transfer pusher, and the transfer car which conveys the slabs from the delivery side of the mill to the entry side, the cold mill is kept in continuous operation. After a series of repeated passes, the cold worked slabs are delivered to a walking-beam type furnace for annealing.

The motor-driven screwdown of the cold mill is controlled from the operator's stand, and Selsyn indicators show the exact roll opening at all times. The horizontal mill rolls are driven by a 2250-hp. a.c. motor through a magnetic clutch. This motor also drives the generator which delivers current to the 1000-hp. reversing motor of the hot breaking down mill.

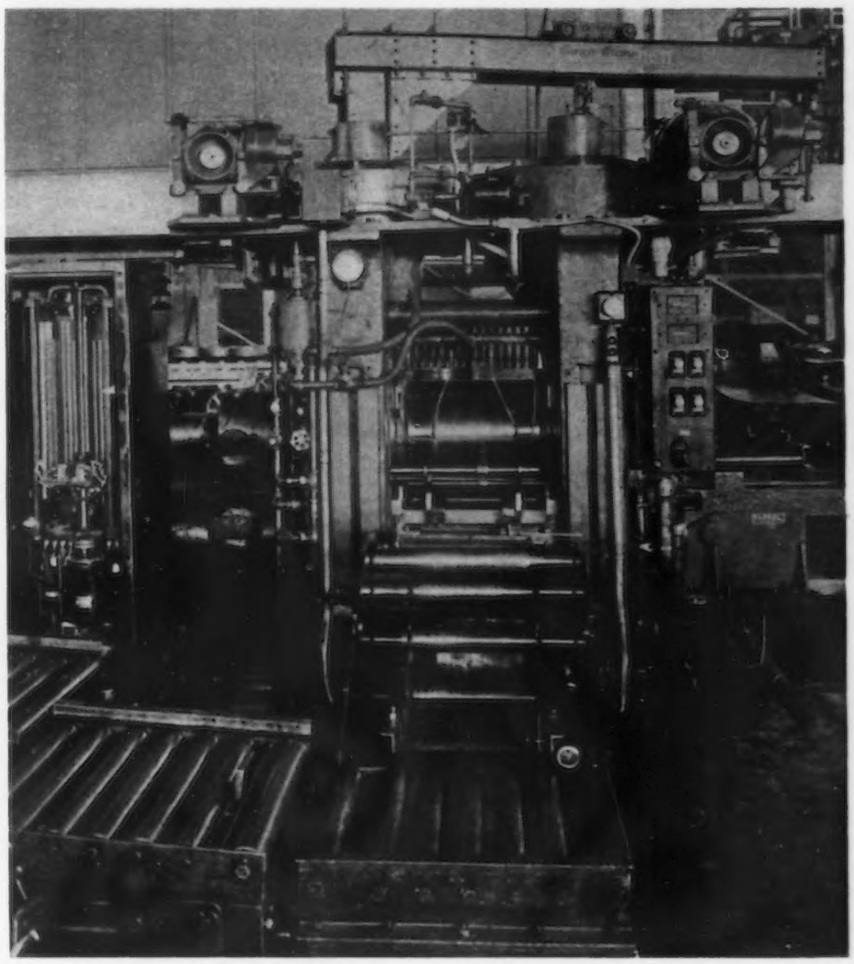


FIG. 6—Two-high finishing mill built by the Farrel-Birmingham Co.

Slab Annealing and Overhauling

The continuous walking-beam type slab annealing furnace that serves the cold mill is equipped with an automatic elevator-loading and hoisting table, and an automatic stripper and feeding mechanism. With the latter pre-set for exact time movement, the slabs are passed through the furnace into a quench tank on the opposite side. The furnace is oil-fired by a series of automatically-controlled burners installed above the hearth on the entry side and below the hearth on the delivery side. A temperature control and recording instrument board shows the exact temperature of each zone at all times and directly compares this temperature with the temperature-setting indicator.

After cooling from this anneal the slabs are transferred by crane to slab milling units where they are overhauled and prepared for further reduction on the two-stand four-high tandem run-down mill. The milling units are equipped with flattener rolls, and a roller table with flop-over is provided between the two machines to permit uninterrupted operation. The milling is always performed on the lower side of the slab so that the chips will fall away from the cutter and not be rolled into the face of the metal. Scrap from the overhauled slab is

(CONCLUDED ON PAGE 92)

. . PERSONALS . .

FRANK M. ROBBINS, president, Ross-Meehan Foundries, Chattanooga, Tenn., was elected president of the Steel Founders' Society of America at a meeting of directors in Cleveland, Jan. 11. A. K. READING, Zimmerman Steel Co., Bettendorf, Iowa, and A. J. McDONALD, Lebanon Steel Foundry Co., Lebanon, Pa., were elected members of the executive committee, which is headed by Mr. Robbins. COL. M. G. BAKER, executive vice-president, R. L. COLLIER, secretary-treasurer, and CHAUNCEY BELKNAP, legal counsel, were all reappointed.

The newly elected board of directors is as follows: E. J. MOHR, Symington Gould Corp., Rochester, N. Y.; THOMAS H. SHARTLE, Texas Electric Steel Casting Co., Houston; D. C. BAKEWELL, Blaw-Knox Co., Pittsburgh; A. H. ANTHONY, Massillon Steel Casting Co., Massillon; BURTNER FLEEGER, Oklahoma Steel Castings Co., Tulsa, Okla.; J. P. ARNOLDY, Warman Steel Casting Co., Los Angeles, and Messrs. McDonald and Reading.

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J. W. ROBINSON has been appointed assistant manager of sales, hot rolled products department, of the Jones & Laughlin Steel Corp., Pittsburgh. He was formerly connected with the Detroit sales office of the corporation. A graduate of the University of Michigan, Mr. Robinson served in the United States Army during the World War and was first employed in 1920 in the metallurgical department of the Wills-St. Clair Co. In 1923 he went to the Packard Motor Car Co. as research metallurgist and in 1927 joined the sales force of the Higgins Bothwell Co., in Detroit. In 1934 Mr. Robinson became associated with the sales staff of the Jones & Laughlin Detroit office.

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I. LAMONT HUGHES has been appointed Secretary of Highways in the cabinet of Gov. Arthur H. James of Pennsylvania. He was a former director and executive vice-president, Carnegie-Illinois Steel Corp., Pittsburgh. His executive ability, combined with a successful career in supervising a large number of employees, will be used to good advantage in the State Highway Department which has a payroll totaling several thousand employees.

Mr. Hughes started out in the engineering department at the Edgar Thomson mill and subsequently became president of the Lorain Steel Co. at Johnstown. In 1920 he went to Youngstown to superintend construction of extensive bar mills at the McDonald plants. He was appointed vice-president of the Carnegie Steel Co. in 1925 and in 1927 went to New York as operating vice-president of the United States Steel Corp. He returned to Pittsburgh in 1930 as president of Carnegie Steel Co. and after the merger of Carnegie Steel and Illinois Steel became executive vice-president and director, which position he held until April, 1936, when he resigned. He is also a past president of the Engineers' Society of Western Pennsylvania.

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JAMES H. CRITCHETT, whose election to the vice-presidency of the Electro Metallurgical Co., New York, was announced last week, was graduated from Massachusetts Institute of Technology in 1909. He was first employed in the electric furnace division of the Illinois Steel Co., at South Chicago, and later became assistant superintendent of the electric furnace department. His next work took him to Buchanan, Mich., where the Buchanan Electric Steel Co., now Clark Equipment Co., erected and operated the first electric steel foundry in the United States. The following two years he was associated with the Hooker Electrochemical Co., Niagara Falls, N. Y.

In 1914 Mr. Critchett joined the metallurgical staff of the Union Carbide and Electro Metallurgical companies at Niagara Falls, devoting his time mainly to the problems of the Electro Metallurgical Co. These companies later became units of Union Carbide & Carbon Corp., and when in 1921 the research activities of that corporation were consolidated, he joined the research organization and his work took him to New York City. He later became vice-president and general manager of the research organization. In his new position Mr. Critchett will supervise the carbide and metallurgical research at Niagara Falls and coordinate their activities with those of the manufacturing and sales divisions.

FRANCIS B. MORGAN, works manager of the Electro Metallurgical Co., has been elected vice-president.

N. C. HURLEY, JR.

J. H. CRITCHETT

NEIL C. HURLEY, JR., who has been identified with the Independent Pneumatic Tool Co., Chicago, since his graduation from the University of Notre Dame in 1932, has been elected vice-president of the company. He has been secretary for the past four years.

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HARRY G. BOW has been appointed manager of sheet sales for the Reeves

Steel & Mfg. Co., Dover, Ohio. Formerly he was manager of sales of Superior Sheet Steel Co., Louisville, Ohio, and prior to that was associated with the Berger Mfg. Co., Canton, Ohio, as general manager of sales.

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EDWARD J. GLEASON has been appointed resident manager of the Fisher Body plant at Cleveland, succeeding Lincoln R. Scafe, who has resigned. Prior to his connection with the company 19 years ago, Mr. Scafe was associated with Timken-Detroit Axle Co., Chalmers Motor Co., Saxon Motor Co. and Dayton-Wright Airplane Co. Mr. Gleason has been assistant manager of the plant for eight years.

I. L. HUGHES

following two years as resident manager of the Buffalo plant.

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CHARLES J. STARK, former president of the Penton Publishing Co. and for many years an employee of that company, has been appointed purchasing agent for the State of Ohio by the newly installed Gov. John Bricker.

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DAN S. KEENAN has been elected president of the Carnegie Natural Gas Co., Pittsburgh, and Apollo Gas Co., Pittsburgh, succeeding the late S. W. MEALS. Mr. Keenan has been vice-president of the gas companies, subsidiaries of the United States Steel Corp., since May, 1938. He became associated with the gas companies after a long service record with the Philadelphia Co. and affiliated concerns, and the United Carbon Co. at Charleston, W. Va.

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JOHN D. BIGGERS, president of the Libbey-Owens-Ford Glass Co., and WILLIAM W. KNIGHT, vice-president of the Bostwick-Braun Co., and for

J. W. ROBINSON

several years a director of the Fourth Federal Reserve Bank at Cleveland, have been named directors of the Toledo Trust Co.

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JOHN T. WISEMAN, for the past 18 years manager of the Bethlehem Shipbuilding Corp., Ltd., 56th St., Brooklyn, yard, has been made general superintendent of the company's Quincy, Mass., yards. Mr. Wiseman is a native of South Boston. He began his shipbuilding career at the old Lawley Yard, South Boston, later was with the General Electric Co., Lynn, Mass., as draftsman, the Brooklyn Navy Yard, Atlantic Corp., Portsmouth, N. H., and subsequently the Morse Dry Dock & Repair Yard, Brooklyn, which was absorbed by Bethlehem interests.

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JOHN G. ANDREWS, formerly of the Boston Bridge Works, Inc., Cambridge, Mass., has become associated with the Boston office of Bethlehem Fabricators, Inc.

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W. J. SCOTT has assumed all the duties of general supervision of the

F. M. ROBBINS

Chevrolet gear and axle plant and the Chevrolet forge plant in Detroit, succeeding S. A. WOODMANCY, who has left the management of the gear and axle plant to become manager of manufacturing for Oldsmobile at Lansing. FRED SKUSA will manage the forge plant, acting under Mr. Scott. Mr. Skusa has been identified with General Motors transmission plant at Muncie, Ind., but at one time he was at the forge plant.

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E. E. LEVAN, who has been general sales manager of the Haynes Stellite Co., Kokomo, Ind., a unit of Union Carbide & Carbon Corp., has been elected vice-president of the Haynes Stellite Co.

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KINLEY D. TRACY, for the past five years in charge of advertising and sales promotion for the Baker Industrial Truck Division, Baker-Raulang Co., Cleveland, has been appointed assistant sales manager. He is a graduate of the school of mechanical engineering of Purdue University and was formerly associated with the Auburn Automobile Co. in a sales and engineering capacity.

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ALEXANDER G. CHRISTIE, national president of the American Society of Mechanical Engineers, has accepted the invitation of the Milwaukee section to be guest of honor and principal speaker at a banquet on Jan. 24.

THIS WEEK ON THE ASSEMBLY LINE

o o o

By W. F. SHERMAN
Detroit Editor

o o o

. . . Production climbs to 86,925, exceeding 1937 and 1938 output . . . New and used car inventory conditions rated satisfactory . . . Studebaker to introduce light car in March.

DETROIT—The automobile production total for the past week showed an increase from 76,685 units in the United States and Canada to 86,925. This was the first substantial increase from the low point of the holdiay season. It was also the first full working week since the holidays and offers an opportunity to compare the level of production with what it has been for the last two years at this season. The comparison for 1936-37, 1937-38 and the season just finished, 1938-39, is shown here. 1936-37 was the year when the automobile industry almost reached 1929 production levels.

Christmas week ...	1936-1937 79,538	1937-1938 49,550	1938-1939 75,215
New Year's week ...	92,142	54,084	76,685
First week after holidays ...	85,703	65,735	86,925

From these figures it can be seen that production for the past week was not only greater than the figure for a year ago, but was also greater than in the 1936-37 season. There is, in this, reason for more than a little optimism. Nobody predicts that the industry will reach 1937 levels, but the current production volume lends strength to the optimism which predicts 25 to 35 or 40 per cent gain for the current year. The comparisons with the high year are presented merely to improve the perspective.

In a similar vein, Ward's Automotive Reports, points out that the industry is starting the new year in full stride. Ward's reiterates its prediction that January will see a total gain of 325,000 units completed, and that the first quarter total will be at least a million.

During the past week the most notable single gain was that made by Ford, with an increase from 17,100 to 21,000 in Ford and Mercury production. There also was an increase in Lincoln-Zephyr production from 640 to 750. Chevrolet added a mite, going up from 20,000 to 20,500. Plymouth showed a minor decrease, from 10,640 to 9,740 units.

It has been learned that both General Motors and Chrysler have reduced January schedules slightly but at this time Ford's increase to a scheduled output of 94,000 units for the month still stands.

Actually, there has been some serious questioning of the relatively high production totals by people interested in the automobile industry, although generally not connected directly with it. Knowing that used car inventories have grown sharply through November and December and that passenger car sales and registrations are showing a seasonal decrease, they have reached the conclusion that automobile production is being artificially maintained above requirements.

From several sources have come positive denials. One spokesman pointed out that it used to be the practice to overbuild during the winter period, even if cars had to be stored in every vacant garage and warehouse in the Detroit district. At the same time, manufacturers were accused of forcing dealers to absorb many extra cars and hold them for spring sale. Today, despite the volume of production, there is little evidence of the storage of excess stocks around Detroit. Dealers do not seem to be flooded with cars nor is it likely that manufacturers would urge extra cars on the dealers.

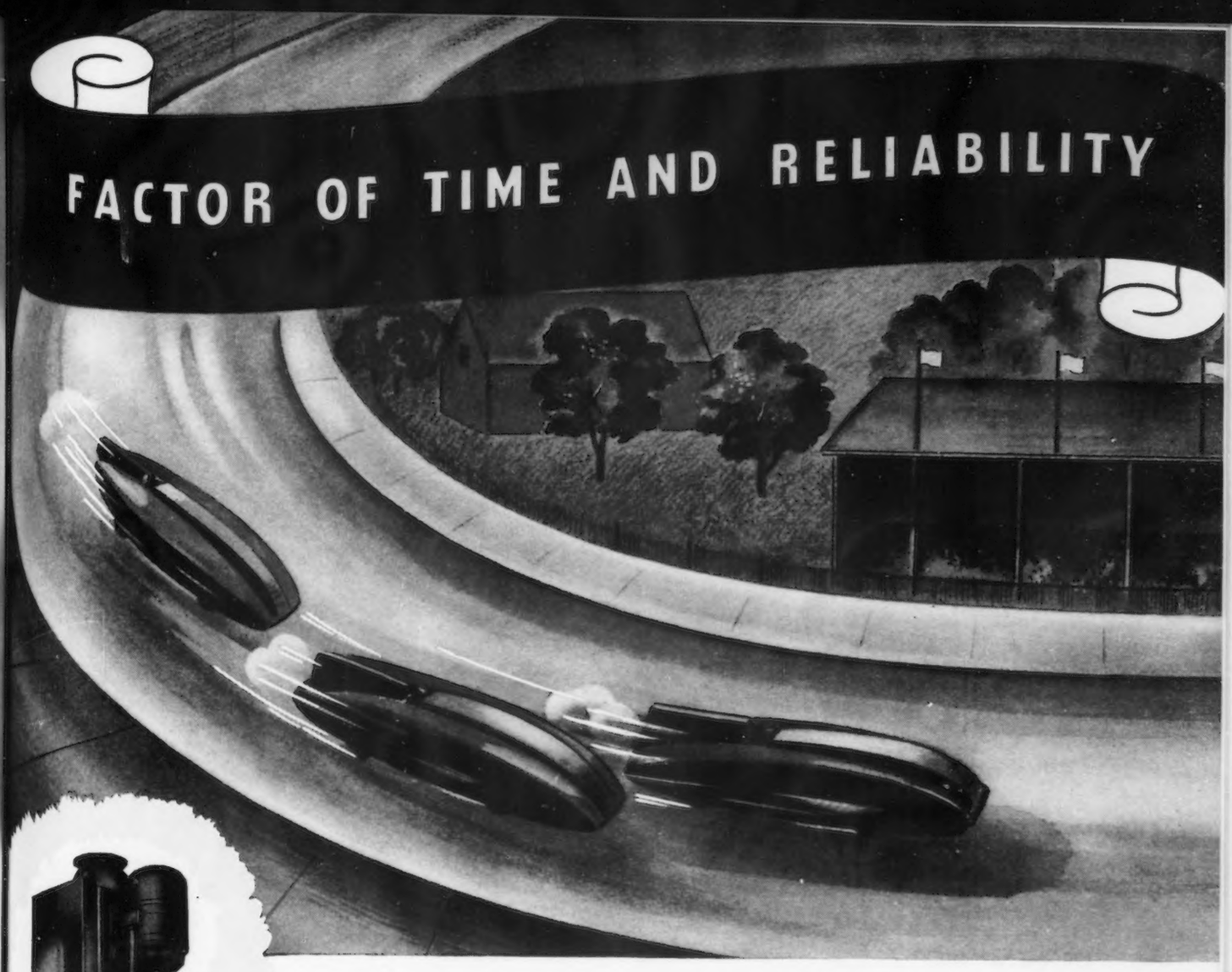
Car Buyers Absorbing Output

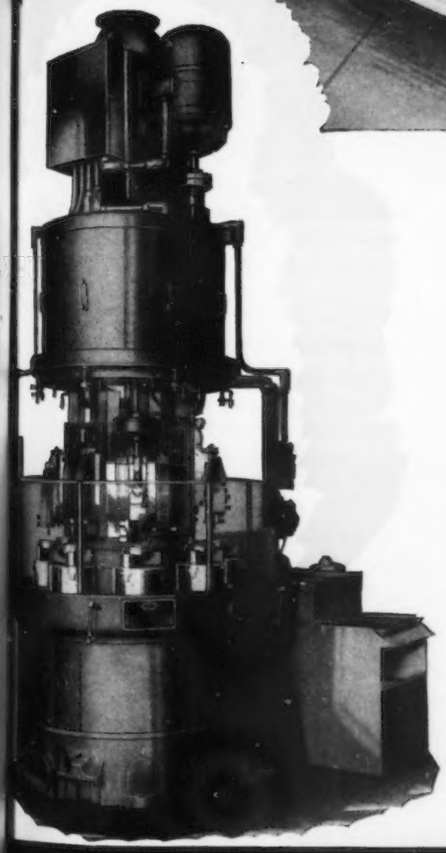
Moreover, the evidence of registration figures indicates that most, if not all of the production, is being absorbed by the customers. The latest available figures from R. L. Polk & Co. for new passenger cars registrations in December cover 18 states. These show 50,290 registrations, compared with 40,949 registered in these 18 states a year ago. Percentagewise, it might be possible to show a greater increase in production than in sales or registrations in this comparison of the two years. But last year, long before this date had been reached it was recognized that the industry was sliding downhill, whereas now the opposite is indicated.

Chevrolet continued throughout December the upward trend established in November, selling 66,830 new passenger cars and trucks, an increase of 4,455 units or 6 per cent over November. In comparison with December, 1937, the increase was 24.7 per cent. Willys-Overland Motors, Inc., showed a consolidated domestic and export total gain of more than 56 per cent in December over the same month of 1937. The gain in shipments from the Toledo plant in December was approximately 83 per cent; the Los Angeles factory shipments were nearly six times the volume a year ago. Oldsmobile figures indicate that for each 10-day period in December there was an increase in number of cars sold.

No estimate of the total number of used cars on the market is available for the industry, but Pontiac reports that used car sales have progressed

FACTOR OF TIME AND RELIABILITY





Round and Round they go—The fastest time and reliability of equipment give us the Winner.

This, too, is true of Bullard Type "J-11" Mult-Au-Matic—Round and Round go the spindles—SPEED—Round and Round goes the carrier—at each Index a finished piece in minimum time.

Watch this machine cross the line and make a Profit on manufacturing operations. Ask for your circular—Ask Bullard Engineers for Details and Estimates on your Jobs.

THE BULLARD COMPANY

BRIDGEPORT CONNECTICUT

steadily every 10-day period of December, with a gain shown also over November. Ordinarily, December is a smaller used car month. From an inventory standpoint, Pontiac dealers had 43 per cent more used cars in stock on Jan. 1 last year than they have this year, the figures being 28,829 this year and 40,240 one year ago.

Automobiles Now Made "To Order"

Another thing that must help to discourage any rumors of mass overproduction is the simple fact that even in the largest plants, with the most perfected mass assembly systems, automobiles are made to order and specifications; they are not just built in anticipation of orders. Sometimes this is customer order, more often, it is a dealer's order. This fact is not generally known and not believed except by those who have seen it in practice.

Each order received in an automobile plant must specify color and all the equipment desired on the car being ordered. As the sales department turns over orders, the scheduling division puts them down for shipment within 10 days. Here starts the exacting job of producing a car with body type, color, trim and equipment to satisfy the customer. Even on the low-priced cars, there are as many as 5,000 possible combinations, it is said. Higher priced cars offer even more options.

Sometimes the combination is specified just by the dealer who lists the types which he knows his customers prefer. Frequently, however, an order includes the specific choice of a buyer willing to wait for the exact combination he desires. The important fact is that today automobile manufacturers have a written order for every car that goes down the assembly line and very seldom just build a collection of cars of various types, expecting that dealers will take them off the factory's storage lot "as is."

This process of scheduling individual cars on the assembly line is interesting to the outsider. Orders are grouped to get similar trim and body combinations together. Meanwhile, parts for the vehicles have been ordered 30 to 90 days ahead, on the basis of estimated needs. Day by day each division is notified of the exact quantities and sequence of parts which they are to turn out and deliver. Outside vendors or suppliers of parts get similar notices.

General practice is to attach a code plate, whose numbers spell out the car's particular specifications, to the body seven days before the assigned shipping day. As the body gets to the paint spray department, it is painted with the correct color as indicated on the code plate. At a previously calculated time, in a distant part of the plant, the same color will be going on a set of fenders swung from a conveyor, on sheet metal parts and on a matching set of wheels. Finally, when a chassis with, say, a red body, comes down the line, red fenders and red wheels appear from nowhere, it seems, and another car to fill a specific order is produced.

New Light Car Coming

Competition in the light car field promises to be enlivened in March when Studebaker launches its new light car. Details cannot be learned officially, but it is known that Budd Mfg. Co. is all set to supply bodies, has, in fact, purchased some steel destined for this use. Trade gossip says that quietly some $3,000,000 has been spent and is being spent to tool up for the car, which will weigh 500 lb. less than Ford, Chevrolet or Plymouth models. The weight reduction is said to have been accomplished by making use of some of the more modern methods of constructing bodies. We would take this to mean a frameless type, although confirmation is lacking. Every indication is that production will get underway March 1, that the car will sell in the $700 to $800 field, delivered price. There is an unused Studebaker assembly line which probably will be used to produce the new car.

News of the forthcoming Studebaker raises interest again in the light Packard which Alvan Macauley mentioned at new model introduction last fall. The company insists that the light car will not make its appearance for a while yet, but activity centering around the new model indicates that it, too, may arrive in the spring.

Union Men Picket Each Other

While Attorney-General Murphy, ex-governor of Michigan, gave his version of the automobile industry's sitdown strikes, and expressed the belief that they were at an end, about 3,000 UAW members staged demonstrations here on Friday. More than 1,000 supporters of Homer Martin, UAW president, having been refused the use of elevators, marched up 10 flights of stairs to the 11th floor of the Griswold Building in Detroit,

(CONTINUED ON PAGE 71)

THE BULL OF THE WOODS — BY J. R. WILLIAMS

WE'RE TAKIN' UP A COLLECTION OF A DIME APIECE TO SEND FLOWERS TO THAT ASSISTANT FOREMAN WHO'S IN TH' HOSPITAL
WHY, I'LL GIVE FOUR BITS-- YES, A DOLLAR!
I DON'T KNOW HOW TO TAKE THAT -- HE'S TH' GUY WHO'S TAKIN' TH' BOSS'S PLACE AN' IS IN LINE FER TH' JOB IF THE OTHER GUY DON'T PULL THRU -- YOU KNOW HE AIN'T SORRY
OLD JUDAS WAS A PIKER! HE'S OVER-PLAYIN' HIS HAND -- HE'S SO ANXIOUS TO MAKE IT LOOK GOOD THAT IT SMELLS BAD!
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THE HEIR APPARENT
J.R.WILLIAMS 1-13

Automotive Products Manufacturers

UNEARTH THE Hidden Profits In YOUR MACHINE SHOP

This MANUFACTURER did .. and now makes $37.20 Extra Profit every 8 hours on this one job alone!

Operation: Rough and finish groove, face ends and spotface hub of automobile water pump pulley.

A Few of the 109 Automotive Parts Having More than 300 Machining Operations on which CARBOLOY Tools Are Paying a Substantial Profit.

REAR AXLE—13 operations, 6 parts
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BRAKE LININGS—3 operations
CAMSHAFTS—4 operations
CARBURETORS—7 operations
CLUTCHES—19 operations, 10 parts
CONNECTING RODS—4 operations
CYLINDER BLOCKS—24 operations
FIXTURES, BODY—10 operations, 7 parts
FLYWHEELS—12 operations

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Do the wheels of your machine shop turn out a monotonous hum of *expense* or do they sing a song of *profits?*

Every machine shop is a potential source of profit—hidden profits that can be unearthed. Plants in the automotive industries have been quick to grasp these dollars that ordinarily slip away. More than 300 operations on 109 different parts now pay a handsome profit-dividend that was formerly the toll of expense.

A 24-page booklet "Hidden Profits In The Machine Shop" tells a story of interest not only to automotive manufacturers but to executives of all plants engaged in machining. Free upon request.

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CEMENTED CARBIDE TOOLS

THIS WEEK IN WASHINGTON

. . . Roosevelt's national defense message found reasonable by some Congressmen . . . FTC's second questionnaire asks distribution data from steel producers . . . Murphy defends self on sitdown strikes as Hopkins says he regrets "politics in relief" developments.

WASHINGTON. — Administration lieutenants on Capitol Hill were making plans this week to take initial action on the major phases of President Roosevelt's national defense message, which called for a Congressional appropriation of $525,000,000 to care for what the President called the country's "minimum requirements" for defense preparations.

If Congress approves the program, national defense expenditures for the fiscal year ending June 30, 1940, will amount to $1,319,558,000. This represents an increase of $309,351,000 over the estimated expenditures for national defense purposes for the fiscal year ending June 30, 1939, and amounts to an increase of $99,351,000 for continuing the current program and $10,000,000 on account of the new $525,000,000 program.

Opposition Tempered

While there were indications that many Congressional members expect to adhere to a "you'll-have-to-show-me" attitude on the projected program, there also were signs that many members, not necessarily confined to the Democratic side, considered the President's message a reasonable analysis of present needs and to that extent the proposals were not expected to meet the opposition anticipated several weeks ago.

Mr. Roosevelt reiterated his reference to "changing world conditions" made in his message delivered to Congress two weeks ago, suggested that it would be unwise to yield to hysteria, but expressed the view that irrespective of political affiliations "we can properly join in an appraisal of the world situation and agree on the immediate defense needs of the Nation." He recalled that during the World War this country had more than a year in which to prepare and yet as late as the autumn of 1918, American armies used artillery and aircraft of French or British manufacture almost exclusively.

Insisting that the country is no better prepared today than it was in 1917, and that there is little likelihood of a long period free from attack in which it could make adequate preparations, the President asked Congress for immediate action.

What Roosevelt Asks

If carried out to the letter, his recommendations would result in the following appropriations:

A total of $25,000,000, of which approximately $210,000,000 would be actually spent from the Treasury before the end of the fiscal year ending June 30, 1940. The Army would get $450,000,000; the Navy, $65,000,000 and $10,000,000 would go for training 20,000 student air pilots. While a complete breakdown of the various items may never be made public, the President's message itemized these suggested appropriations for the Army:

1.—$450,000,000 would be allocated for new needs, of which $300,000,000 would go for a minimum of 3000 planes—perhaps more if large-scale orders can be made to reduce the unit cost of manufacture. The President suggested that $50,000,000 of the $300,000,000 be made available immediately "to correct the present lag in aircraft production due to idle plants";

2.—$110,000,000 for "critical items" such as anti-aircraft artillery, semi-automatic rifles, anti-tank guns, tanks, light and heavy artillery, ammunition and gas masks and other materials which cannot be obtained from any source within the time and in the quantities desired;

3.—$32,000,000 for "educational order," an increase of $22,000,000 over the amount appropriated last session which was intended to cover a five-year period.

4.—$8,000,000 for improving and strengthening the seacoast defenses of Panama, Hawaii and the continental United States, including the construction of a highway outside the limits of the Panama Canal Zone, an item considered important to the defense of the area.

Needs for the Navy

For the Navy, the message recommended a total of $65,000,000 allocated this way:

1.—$44,000,000 for the creation or strengthening of Navy bases in both oceans;

2.—$21,000,000 for additional Navy airplanes and air material tests.

Over and above the projected Army and Navy appropriations would be $10,000,000 appropriated for training 20,000 students as air pilots. Also, a $27,000,000 appropriation would provide an adequate garrison and adequate personnel to man the anti-aircraft and seacoast armament in the Canal Zone. About $5,000,000 of the $27,000,000 would be made available immediately to start construction of needed housing facilities in that area.

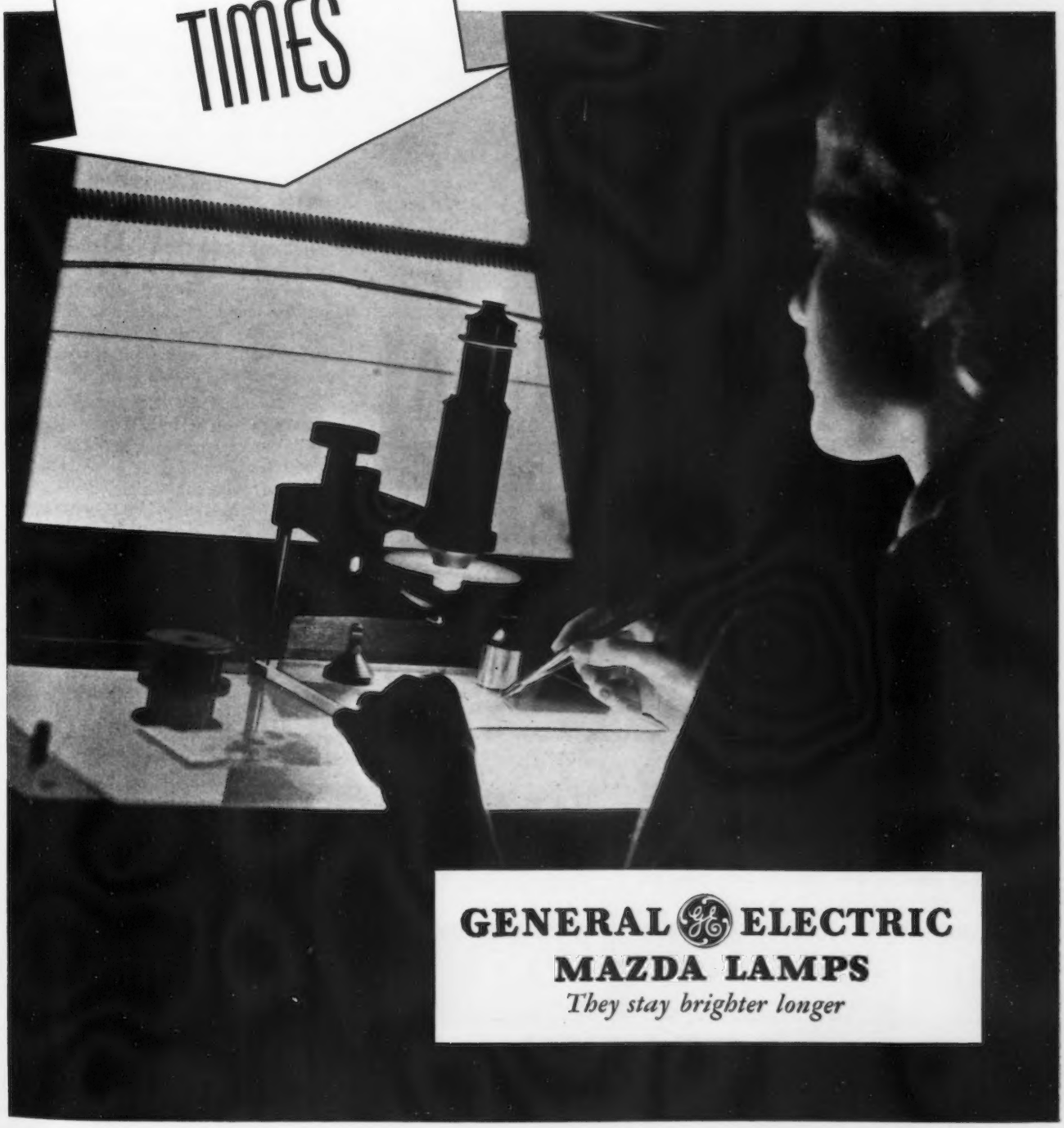
The defense message by itself does not present a complete picture of all armament activities to be undertaken during the next 18 months nor does it give many of the details which subsequently will be worked out in hearings on Capitol Hill between the departmental and legislative branches of the Government. Reference to the budget message sent to Congress two weeks ago, indicates an estimated Navy Department appropriation for the fiscal year ending June 30, 1940, of $720,987,403 as compared with an appropriation of $559,175,744 during the current fiscal year.

Aviation Cost Rises

Major increases in the Navy appropriations have been earmarked for replacement of Naval vessels and for

MAGNIFIED 60 TIMES

ONE OF THE REASONS why MAZDA lamps made by General Electric give more light in 1939 is the improved tungsten filament that burns brightly inside the lamp. Finer than a human hair, it is coiled into a tiny spiral, then magnified 60 times for final inspection. Below (top to bottom) a coiled filament, a human hair, an uncoiled filament. When you buy G-E MAZDA lamps you are sure of getting the benefit of the latest improvements in lamp bulb manufacture. General Electric Company, Nela Park, Cleveland, Ohio.



GENERAL ELECTRIC
MAZDA LAMPS
They stay brighter longer

the Bureau of Aeronautics. A total of $270,000,000 as compared with $154,113,150 for the current fical year, is listed for starting construction of Naval vessels, plus $4,000,000 for alterations and repair work. The Bureau of Aeronautics appropriation for the next fiscal year has been estimated at $74,000,000, as contrasted with $48,075,000 for the current fiscal year.

The President's budget figures showed an estimated War Department appropriation of $515,979,944 for the next fiscal year as compared with a $506,564,438 appropriation for the current fiscal year. The Ordnance Department's share would be boosted from $39,191,724 for the current fiscal year to $46,188,835 for the next fiscal year, plus a contract authorization of $8,000,000.

Although 3000 planes was the specific figure mentioned in the defense message, it was generally expected that first-class combat planes on hand plus those already under construction, authorized and appropriated for, would swell the total to around 8000 planes for both Army and Navy after the projected 3000 are completed. It was estimated last week by the National Aeronautical Chamber of Commerce that the industry could deliver 5500 military planes a year with existing plant equipment.

Other Phases Dark

Despite the Presidential message, other phases of the national defense program remain shrouded in mystery. The contemplated plan for training airplane mechanics was not mentioned in the budget message and the President said at a press conference on Friday that it was omitted because the plans have not been completed. A system of transcontinental highways, as a defense arm, also appeared to be in the New Deal hatchery. Asked if any system of special roads were needed as a part of the anti-defense program, Mr. Roosevelt said there was a lot of interest in transcontinental and north-south highways and that there is under consideration a plan for putting WPA employees at work on such a project. He indicated that plans are still in a formative stage but that the idea is apparently becoming more popular on Capitol Hill.

Mr. Roosevelt also was asked about the lag in shipbuilding activities, which reportedly was the subject of a recent conference between him and Assistant Secretary of War Edison. Beyond explaining that the matter was under consideration and that the Navy Yards are bending all efforts to regularize employment throughout the year, the President did not elaborate.

Critical Materials Fund

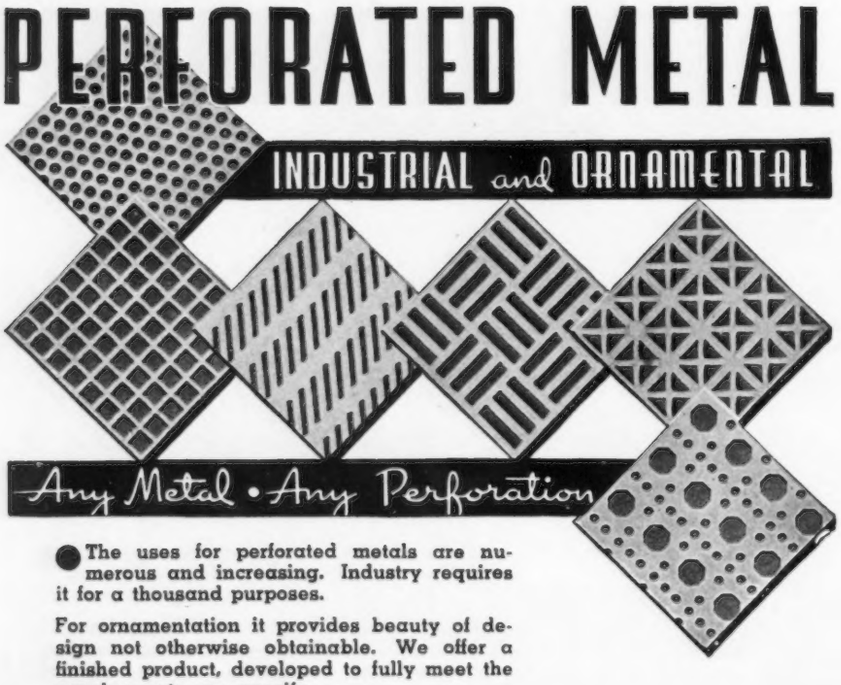
Among the first to drop a national defense measure in the legislative hopper was Senator Thomas, Democrat of Utah, who is chairman of Senate Military Affairs Sub-committee which last year handled the hearings on proposed scrap licensing legislation. Described by the Senator as the forerunner of defense legislation made necessary by "the international situation and outside competition for armaments," the bill would authorize the appropriation of $25,000,000 a year for four years for purchasing and storing so-called strategic and critical materials of which this country has an inadequate domestic supply.

The measure embodies a plan to build up stocks of manganese ore, chrome, tungsten ores and pig tin from normal foreign sources of supply sufficient to meet war-time requirements. Senator Thomas said the approved list contains 40 different materials.

The budget message listed an appropriation of $3,545,000 for the procurement of "stocks of materials to be maintained as a war reserve" and Thomas' proposal, which provides for an authorization of $25,000,000, is understood to have the backing of both War and Navy Departments. A companion bill has been introduced in the House by James G. Scrugham, Democrat and representative-at-large from Nevada.

PERFORATED METAL

INDUSTRIAL and ORNAMENTAL



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1938 Track Shipments Decline 62 Per Cent

SHIPMENTS of trackwork for T-rail track of 60 lb. per yard and heavier amounted to 34,710 tons in 1938, a 62 per cent drop from the 1937 total of 92,121 tons, according to data released by the American Iron and Steel Institute. The 1938 figure is the lowest yearly total since 1933 when shipments were 30,824 tons. Shipments in December were 2620 tons, a slight gain over the 2276 tons shipped in the previous month, but below the year's monthly average of 2892 tons. In December, 1937, shipments were 3804 tons.

NLRB "Endorses" Lynch Law, Fansteel Attorney Holds

WASHINGTON — Counsel for the Fansteel Metallurgical Corp., of North Chicago, Ill., argued before the Supreme Court last week that the National Labor Relations Board, in ordering sit-down strikers rehired by the company, had endorsed "lynch law." He insisted that the Wagner Act "does not embrace a license to seize the employers' plant" in a sitdown strike.

Max Swiren, counsel for the company, told the court that the purpose of the Act is to "secure strikers in their status as employees—not to provide them with a cloak of immunity from discharge for proper cause." He vigorously denied that there was any congressional intent that ceasing work involving a labor dispute conferred "a license for plant seizure, violence or other acts constituting legitimate grounds for discharge."

Charles Fahy, general counsel for the NLRB, took the position that the board acted well within the power conferred upon it by Congress when it issued its order against the company, which directed the firm to reinstate sitdown employees discharged back in 1937. Challenging the Federal Circuit Court decision that the Fansteel company had the right to dismiss sitdown strikers who took over two of the company's buildings for a nine-day period, Mr. Fahy told the Court the sitdown strike resulted from the firm's refusal to bargain with the Amalgamated Association of Iron, Steel and Tin workers, CIO affiliate.

Worker Always Right

Mr. Fahy was closely questioned by members of the Court. Asked by Chief Justice Hughes if there was no conduct, irrespective of how illegal, which would justify dismissal of an employee after an "unfair labor practice" had been committed by an employer, the NLRB counsel answered, "That is the scope of my argument."

Also heard by the Court was the controversy involving the Columbian Enameling & Stamping Co., of Terre Haute, Ind., in which the NLRB held that employees who strike during a labor dispute retain their status as employees even though they are under contract not to strike.

To the Board's contention that the company had refused to bargain with the workmen involved, Earl F. Reed, attorney for the firm insisted there was no substantial evidence to that effect, and that the employees were

TODAY'S conditions put a severe strain on the ability of any manufacturer to operate at a profit. ✦ Obviously, cost reduction is one way. Product improvement at no increase in cost or even at less cost is another. Combine the two and you have gone far toward the goal of profitable operation. A wood working machinery manufacturer did this with the aid of a modern Landis Hydraulic Universal Grinder. Previous to the installation of this grinder motor columns were purchased on the outside. Rejects were at times as high as 50%, this meaning delay in production. Then an attempt was made to turn them out in his own plant on old equipment. Two and one-half hours time was required for each. The modern Landis has cut this time to twenty minutes and rejects are almost unheard of. ✦ Another part is ground within a limit of .0002". It weighs but three ounces, while the motor column previously referred to weighs fifty-seven pounds. Yet the same machine investment enabled the user to cut costs and improve product in both cases. ✦ Don't miss your chance for making profits even under today's trying conditions. Modern grinding equipment may be a part of the answer. 282

LANDIS TOOL COMPANY
WAYNESBORO, PENNSYLVANIA

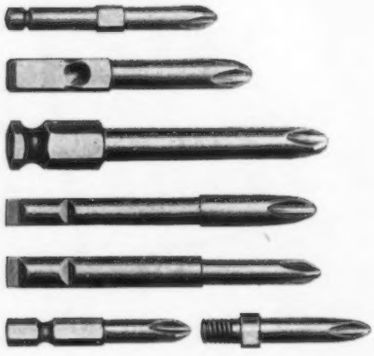
PRECISION LANDIS GRINDERS

Invest in Landis

APEX

POWER BITS

for Phillips Screws ⊕ ⊖ for Slotted Screws



Apex-Phillips Power Bits cover the entire range of Phillips Screws and, in design, to fit all makes of electric, air and spiral drivers.

Power Bits for Slotted Screws are made for all types of Power Tools and in size from No. 4 to No. 16 screws.

Apex Power Bits are made from a special shock-resisting steel, heat treated and tempered to give maximum hardness, toughness and wear resistance.

Apex-Phillips Hand Screw Drivers are General Purpose and Super Service types. The Super Drivers are recommended for self-tapping and case-hardened screws.

Prompt deliveries.

Lower tool costs are a certainty when you use APEX.

HAND DRIVERS

Write for Circular No. 10

Phillips License No. 2
Patents Nos. 2046837-38-40

The APEX MACHINE & TOOL Co.

Dayton, Ohio

under contract specifically not to strike.

This case, which grew out of the NLRB order to reemploy 250 workers, also had been acted upon by the Circuit court adversely to the Labor Board. In both cases the Supreme Court is expected to act promptly.

Murphy Reveals Warning to CIO, Defends His Policy on Sitdowns

WASHINGTON. — Though previously approved by the Senate Judiciary Committee for confirmation as Attorney General, Frank Murphy appeared before the committee at his own request last Friday and defended his policies as Governor of Michigan with regard to sitdown strikes, revealing for the first time a virtual ultimatum read by him to CIO Chairman John L. Lewis and UAWA President Homer Martin which brought a quick end to the strikers' resistance to a court ouster order and settlement of the General Motors strike in February, 1937.

While Mr. Murphy was setting forth his position before a sympathetic committee, Harry Lloyd Hopkins, due for confirmation as Secretary of Commerce, was completing some unpleasant hours before the Senate Commerce Committee. During the hearing, the former WPA Administrator admitted and said he regretted political derelictions of that gigantic relief agency during his regime.

Frankfurter Explains

Meanwhile, Felix Frankfurter, Supreme Court appointee and until last week a Harvard Law School professor, satisfactorily explained his political philosophy to the Senate Judiciary Committee, thereby assuring his confirmation to the high court. By an interesting coincidence, Mr. Murphy was telling the Judiciary Committee in definite terms that sitdown strikes are clearly illegal at the same time that NLRB Counsel Charles Fahy appeared before the Supreme Court, arguing in a case involving the Fansteel Metallurgical Corp., of Chicago, that an employer who committed an unfair labor practice could not dismiss sitdowners. Mr. Fahy was sharply questioned on the point by court members.

Former Governor Murphy, in a prepared statement read to the Judiciary Committee, denied in a firm but quiet voice, that he condoned sitdown strikes and that the course pursued by him led to settlement of the labor controversy without bloodshed or property losses. He said he did not ignore the court writ ordering sitdowners to evacuate General Motors property. On the contrary, he declared, he warned union representatives that he would enforce the order.

Mr. Murphy explained his delay in acting to the fact that the automobile workers' unions were comprised mostly of "high-spirited young men" and to the absence of machinery for settling strikes. He knew, he told the committee, that literal enforcement of the writ would not only disrupt negotiations, "but could not be carried out without the gravest risk of property damage, riot and even bloodshed, which would leave bitterness and ill-feeling between the company and the men for years to come."

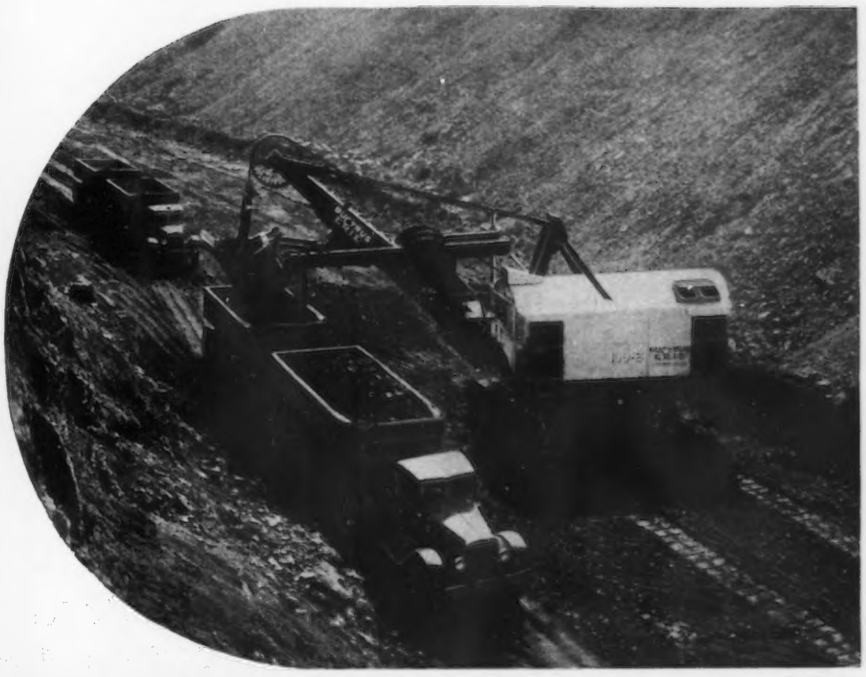
The warning, however, followed and Mr. Lewis and Mr. Martin were told that "the time has come for all concerned to comply fully with the decision and order of the court and restore possession of the occupied plants to their rightful owners." Mr. Murphy recalled that the strike came to an end the following day. He produced letters from General Motors official and prominent public men commending him for his policy.

Mr. Hopkins, in contrast to his abrupt attitude toward business when he headed the WPA, ostensibly is now attempting to cultivate the good will of business and to cooperate with it as Secretary of Commerce. He has held numerous conferences with business groups and his friends contend that he has made a favorable impression and that he has received assurances that they are desirous of working with him.

Whatever may develop in this direction, the fact remains that large sections of business still insist that it would be difficult to choose a man less qualified than Mr. Hopkins to head the Government department which is the one most closely associated with business. If the former WPA administrator has been elevated to the Cabinet post as a build-up as a Presidential candidate in 1940, it is strongly doubted that the strategy will be successful.

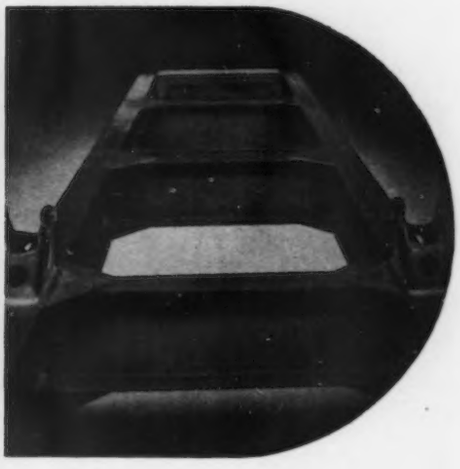
ALLOY NICKEL STEELS

Boost the PAYLOAD ... and CUT HAULAGE COSTS



40 TONS PER TRIP

Typical of the tremendous capacities that are being developed through the use of the Nickel alloy steels, are these trailer units which handle 40 tons of coal per trip in an Illinois strip mine. By employing strong, tough Nickel alloy steels, the manufacturer, Austin-Western Road Machinery Co. of Aurora, Ill., was able to develop giant trailers which have substantially reduced haulage costs. Weight of parts was materially reduced, without decreasing safety factor or dependability. Nickel alloy steels were used for the rear axles, spring shackle bolts, spring shackle shaft, spring clips, wheel studs, brake drum bolts, air cylinder valve stem, cross head and pivots.



WEIGHT REDUCED 25%–30%

Another striking example of high pay load capacities which the Nickel alloy steels make possible is this semi-trailer which carries a 20-ton load concentrated over a length of only 8 feet. The high strength-weight ratio of the Nickel alloy steels effected a saving of 25-30% in the weight of the frame as well as substantial weight savings in other highly stressed applications. Producer of this unit is Utility Trailer Manufacturing Co. of Los Angeles, using Nickel alloy steels obtained from Bethlehem Steel Co.

We invite consultation on the use of the Nickel alloy steels in your equipment.

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL ST., NEW YORK, N. Y.

FTC's Second Steel Questionnaire Ready

WASHINGTON — The second Department of Justice - Federal Trade Commission steel questionnaire, after a delay in printing, now is ready to be mailed to the same steel producers who received the first questionnaire. The second one will ask for data on distribution only, covering records for 1936, 1937 and 1938 on the same 10 products as those dealt with in the first one, which covers both prices and distribution for February, 1939.

More than one third of the 54 companies to which the first questionnaire was sent have informed the department of justice that they will fill it out as soon as it is possible and generally indicated that the desired information will be submitted by mid-March.

The third questionnaire will be sent out, steel makers have been informed by Thurman W. Arnold, assistant attorney general, "when seasonal pressure upon clerical personnel of reporting companies has lifted." It will ask for the same information as that asked for in the first one and will cover a single month in each of the years 1937 and 1938.

The information will be turned over to the Temporary National Economic Committee in connection with its investigation of the steel industry. It is expected to be several weeks before the steel hearings are begun.

GREATER MILEAGE
CRANE WHEELS
The principal advantages of Standard rolled steel crane wheels are greater strength and toughness and better adhesion to the rail with a minimum of wear on the wheel and rail.
The open hearth steel used in these wheels is produced in our own furnaces subject to close metallurgical control.
STANDARD STEEL WORKS CO.
Subsidiary of the Baldwin Locomotive Works
PHILADELPHIA, PENNA.
PRODUCTS
Steel Castings
Forgings
Rolled Wheels
Heavy Springs
Rolled Rings
Gear Blanks
STANDARD

Government Machinery Awards Increase

WASHINGTON—Federal Government contracts for iron and steel products awarded under the Walsh-Healey Act during the week ended Jan. 7, amounted to $326,922.31, while machinery awards totaled $1,941,505.98.

Details regarding the foregoing and related contracts follow:

Iron and Steel Products

Elastic Stop Nut Corp., Elizabeth, N. J., nuts	$16,754.67
National Forge & Ordnance Co., Irvine, Pa., housing forgings	127,520.25
The Shaw-Kendall Engineering Co., Toledo, Ohio, steel tubing	13,159.20
Southern States Steel Corp., Dallas, Tex., reinforcing steel	10,974.32
The Paterson-Leitch Co., Cleveland, reinforcing steel	10,300.00
The Stearns-Roger Mfg. Co., Denver, gate seats	36,251.00
John W. Beam, Denver, steel anchorages	35,900.00
American Bridge Co., Cincinnati, structural steel	18,387.37
Frank M. Weaver Co., Inc., Lansdale, Pa., structural steel	10,388.00
Bethlehem Steel Co., Bethlehem, Pa., sections	47,287.50

Other Machinery

York Ice Machinery Corp., Philadelphia, air-cooling systems	$64,141.00
The Cleveland Tractor Co., Cleveland, tractors	17,958.72
Newport News Shipbuilding & Dry Dock Co., Newport News, Va., turbines	227,963.00
Newport News Shipbuilding & Dry Dock Co., Newport News, Va., hydraulic turbines	1,483,905.00
Westinghouse Elec. & Mfg. Co., Washington, gears and parts	27,651.26
Mattison Machine Works, Rockford, Ill., grinding machine	15,560.00
The Ohio Injector Co., Wadsworth, Ohio, pipe fittings	21,457.00
Rexair, Inc., Detroit, Mich., vacuum cleaners	Indefinite
The American Laundry Machinery Co., Cincinnati, laundry equip.	42,820.00
Fletcher Works, Inc., Philadelphia, nitrocellulose centrifugals	40,050.00

Electrical Apparatus and Supplies

Habirshaw Cable & Wire Div., Phelps Dodge Copper Prod. Corp., New York, cables	$19,438.25
Woodward Governor Co., Rockford, Ill., governors	60,415.00
Woodward Governor Co., Rockford, Ill., governors	68,354.00
Powers X-Ray Products, Inc., New York, radiographs	12,500.00

Pulverized Coal

(CONCLUDED FROM PAGE 29)

distribution with greatly increased maintenance and expense.

The unit system is also handicapped by the fact that since the mill delivers pulverized coal to the burner at the same rate as raw coal is fed into the mill, any delay caused by wet coal clogging the feeder stops the flow of pulverized coal into the burner. However, the amount of air being used at normal requirements continues to discharge into the furnace, causing oxidation of the charge.

Fig. 1 shows a unit system for melting metals, which is in operation from 8 to 12 hr. per day and 5 days per week.

An Improved System

Growing acceptance of pulverized coal and mechanical progress in equipment led to the eventual development of an improved system which provides the advantages of both original systems. This improved system consists of placing the coal plant at the point where the raw coal is received in the works, without regard to the location of the furnaces. The raw coal is received in crushed or slack form and is conveyed to a storage pile or large bin. From this bin the coal is conveyed to a feed bin for the pulverizer or pulverizers.

The operating cycle begins at this point, as shown in Fig. 2. The coal is fed into the pulverizers, ground, and is dried in the mill by the admission of hot air at a temperature of 200 to 300 deg. F., and placed into a pulverized coal storage bin. With this method, the pulverizer need only be operated the number of hours required to grind a 24-hr. coal supply for the furnaces, so that in no case will the pulverized coal remain in the storage bin over 48 hr.

The pulverized coal is then available for gravity feed to a transport tank, where a scale is provided to apportion the desired quantity to each furnace. It is then delivered to sub-station storage bins through pipes of 3, 4, or 5 in. diameter by means of compressed air.

A control panel board is provided for the distribution of the fuel from the coal plant bin to the sub-station storage bins which serve an individual or group of furnaces.

The prepared and dried coal is then measured and delivered to an air duct by a special feeder, as shown in Fig. 3. The blower supplies sufficient air to convey the coal at the correct velocity to the burner, where a secondary air fan provides the additional air required for complete combustion.

It becomes obvious that in the interest of safety, a combustible mixture of coal dust and air is not present anywhere in this system except at the burner entering into the furnace.

Ed. Note—This article will be completed in a subsequent issue with a detailed description of the operating units of this improved system for handling pulverized coal.

WELDING COSTS CAN BE CUT—
HERE'S HOW OTHERS DO IT
Murex Electrodes have provided the answer to many a fabricator's problem of how to lower welding costs and still do superior welding.
To give you more efficient welding, our laboratory is continually at work on research and development of electrodes. The Murex line is constantly being improved and added to. In the past year, for example, four new electrodes have been introduced and have won immediate acceptance. These include straight and reverse polarity all-position rods, a new high speed downhand electrode, and one designed for all positions on carbon-molybdenum steel.
—Ask to have our nearest representative show you what Murex can do. No obligation, of course.
Also, send for your copy of the handy pocket-size Murex pamphlet giving concise data on the properties and applications of the various Murex Electrodes.
MUREX
HEAVY COATED
ELECTRODES
METAL & THERMIT CORPORATION
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1 Ease of handling in tight places, and in vertical and overhead positions saves time when installing welded piping and fittings. Photo courtesy Consolidated Edison Co., New York City.
2 Welds in heavy equipment, such as this press frame made of 78,000 lb. tensile strength steel, are speedily made with Murex Carbon-Moly 50 to withstand shock and vibration. Photo courtesy Dayton Fabricated Steel Co., Dayton, O.
3 In pressure vessel work, X-ray clean deposits, secured by Murex, prevent costly chipping out and rewelding of faulty seams. Photo courtesy Fulton Steel Tank Co., Tulsa, Okla.
4 In machine tool frames, where welds must be good looking to enhance product appearance, smooth clean Murex deposits save cleaning and grinding. Photo courtesy United Welding Co., Middletown, O.
5 Welders prefer Murex. Spatter-free deposits save cleaning time. Higher heats speed work, particularly with Fillet and other rod Murex rods. Photo courtesy Ryan Car Co., Chicago, Ill.

USE BISCO TUBING

YOU PAY LESS
-for Steel
-for Labor

There is no need to pay for steel you don't use, or the labor needed to cut it into small chips . . .

Yet that is just what you do, when you make bushings and rings from solid stock.

It's better to make them from BISCO STEEL TUBING —which comes in all diameters up to 14 inches.

Have some in stock, of the sizes most often used. You'll save *time* as well as *money*.

BISCO TUBING

Tool Steel
Alloy Steel
Stainless Steel
Cold Drawn Steel
For Mechanical Uses
For Ball Bearings

All fine steels in the form of TUBING

THE BISSETT STEEL COMPANY
945 East 67th St.
CLEVELAND, OHIO

ORDER FROM STOCK

Gear Makers Form Lubrication Committee

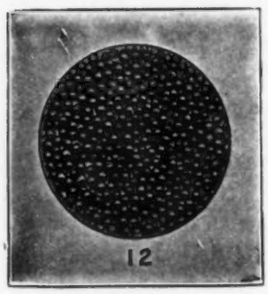
RECOGNIZING the increasing importance of proper lubrication for gearing, the American Gear Manufacturers Association has formed a special technical committee to study and recommend standards for oils, greases and special lubricants to meet the varying requirements imposed by high speeds, extreme loads and climatic conditions.

Members of the committee are: H. A. McConville, works laboratory, General Electric Co., Schenectady, chairman; J. D. Christian, J. D. Christian Engineers, San Francisco; J. E. Fouchaux, Watson Flagg Machine Co., Paterson, N. J.; C. B. Hamilton, Hamilton Gear & Machine Co., Toronto, Ont.; A. Kuhns, Farrel-Birmingham Co., Buffalo; and F. Richards, Westinghouse Electric & Mfg. Co., Pittsburgh.

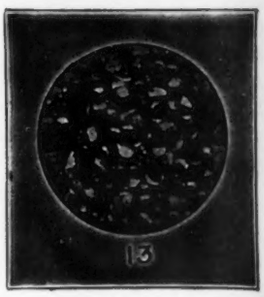
Members from cooperating organizations are: J. Batesole, Norma Hoffman Bearings Corp., Stamford, Conn., representing the Bearing Engineers Committee; O. C. Bridgeman, United States Bureau of Standards; A. L. Clayden, Sun Oil Co., Marcus Hook, Pa., representing the Society of Automotive Engineers; Prof. G. B. Karelitz, Columbia University, New York, representing the American Society of Mechanical Engineers; and H. C. Mongey, General Motors Research Corp., Detroit, representing the American Society for Testing Materials. J. C. McQuiston, 602 Shields Building, Wilkinsburg, Pa., is secretary of the gear association.

Sheet Metal Mfg. Co. Sold to Reliance Steel

CLEVELAND — Reliance Steel Corp., Cleveland, has purchased the Sheet Metal Mfg. Co., Youngstown, jobber and wholesaler of steel. This makes 10 warehouses for the Reliance company, the others being in Worcester, Mass., Newark, N. J., Philadelphia, Toledo, Ohio, Chicago and Detroit. It has built a new warehouse in Detroit along the Pennsylvania Railroad tracks and will shortly dismantle the old one. Sol Friedman is president of Reliance. Thomas J. Farrell, head of the Youngstown company, will retire, but the plant will be operated by Thomas J. Fitzgerald, formerly vice-president, as sales manager.



SHOT



GRIT

Unusual quality is creating demands for both our Heat-Treated Chilled Shot, and Heat-Treated Steel Grit.

One contract calls for 300 tons of our steel grit; another contract calls for 250 tons of our Special Heat-Treated Shot. Many carload lots of both shot and grit.

There must be a reason for this, and the reason is plain: namely, unusual quality; prompt deliveries; uniform quality the year round; satisfactory prices.

Send samples of the sizes you are now using. We will match any size, and name prices that will interest you.

We manufacture a shot and grit that you will eventually use.

HARRISON ABRASIVE
Corporation
MANCHESTER, NEW HAMPSHIRE

We Never Compromise With Quality

G-E Lightning Film "Buried" in Crypt

WHETHER lightning will exist 6000 years from now when the sealed Oglethorpe University "Crypt of Knowledge" is opened so that the people living at that time may know more about our present civilization, is unknown, but the people will be able to see the flash and hear the roar of artificial lightning as it is now produced.

A sound film demonstrating artificial lightning produced by the 10,000,000-volt generator in the Pittsfield, Mass., plant of the General Electric Co. will be sealed in the air-tight crypt. This film, together with four others, has been presented to T. K. Peters, director of archives, Oglethorpe University.

Minneapolis to Ship Scrap By Barge Down Mississippi

THE Fort Dodge Iron & Metal Co., Fort Dodge, Iowa, has established an office in Minneapolis to develop a program for the shipment of iron and steel scrap from the Northwest down the Mississippi River to markets. The Minneapolis City Council has provided space at the municipal barge terminal for assembling upward of 50,000 tons of scrap this winter for spring shipment. The city will furnish a lifting magnet for loading the scrap on barges. Sidney R. Robinson, vice-president of the Fort Dodge Iron & Metal Co., believes that scrap can be shipped even to Pittsburgh. Nearer mills which can be reached by water are those at Granite City, Ill., and Peoria, Ill. For export shipments the scrap will be transported by barge to New Orleans.

C-I Gives Scottdale Works to Community

SCOTTDALE, Pa.—Carnegie-Illinois Steel Corp. has signed over its former Scottdale works, including 11.2 acres and mill buildings, to a non-profit organization, the Scottdale Community, Civic and Industrial Association.

This group is reconditioning the mill buildings and it is hoped by March 1 a portion of the plants will be occupied by the R. E. Uptegraff Mfg. Co., Pittsburgh, maker of transformers. The Scottdale Community Association is endeavoring to find other manufacturers to whom the balance of the building can be rented.

Veteran springmakers are balanced with the enthusiasm of youth...technically trained men with practical knowledge ..for a product of uniform, dependable quality, now, or years from now. The quality is Dunbar's, the products:
SPRINGS, WIRE FORMS, SMALL STAMPINGS

Send your Spring quiries to

DUNBAR BROS. CO.
DIVISION OF ASSOCIATED SPRING CORPORATION
BRISTOL, CONNECTICUT

SAFETY STEEL HOLDERS
WITH SNAP CHANGE
EFFICIENCY—DURABILITY—SAFETY

HAND MODEL **SLEDGE MODEL** **AXE MODEL**

DESIGN AND STEEL PROTECTED BY U. S. PATS. 2,089,794 AND RE 17846

EFFICIENCY—Because—character's cutting edges 50% to 100% longer life

DURABILITY—Because—tools are 25% lighter, 50% stronger

SAFETY—Because—heads do not spall or mushroom

M. E. CUNNINGHAM COMPANY
101 E. Carson St. Pittsburgh, Penna.

. . . OBITUARY . . .

GEORGE EATON SCOTT, president, American Steel Foundries, died on Jan. 11 at Rochester, Minn., of a heart attack, aged 67 years. Mr. Scott had gone to Rochester for a throat operation after a month's illness. In 1901, Mr. Scott went to Chicago from St. Louis, where he was associated with the Simmons Hardware Co., as vice-president of the Simplex Railway Appliance Co. In 1905 that company was merged with American Steel Foundries, Mr. Scott becoming a vice-president. He was named president in 1929. An enthusiastic sportsman, Mr. Scott founded the Ivy Walton Conservation Foundation. He was general manager and member of the American Red Cross Council from 1917 to 1919 and a member of the executive council since 1919. At the time of his death, Mr. Scott was a director of the Harris Trust & Savings Bank, Chicago, the Chicago *Daily News*, H. Cannon Co., Griffin Wheel Co., Bliss & Laughlin, Inc., the Wahl Co., and the Personal Loan & Savings Bank, Chicago.

❖ ❖ ❖

Mrs. Emma Eurana Dinkey Schwab, 79, wife of Charles M. Schwab, chairman of the board of Bethlehem Steel Corp., died last week in New York City.

G. E. SCOTT

Mrs. Schwab was frequently credited by her husband with helping to build the steel company he heads. She was the daughter of Reuben Dinkey, first steel works chemist in the United States, and the sister of the late Alva C. Dinkey, who rose from waterboy to the presidency of the Carnegie Steel Co.

When she became his wife in 1883, Mr. Schwab was chief engineer and assistant manager of Carnegie Steel's Edgar Thomson works at $250 a month. They lived in Braddock, Pa., where Mrs. Schwab aided her husband in setting up a chemist's laboratory. Last May they celebrated their 55th wedding anniversary.

Attending the funeral services at the Schwab home, which overlooks the Hudson river, were James A. Farrell, former president of United States Steel Corp. and other steel leaders.

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CHARLES G. TAYLOR, purchasing agent for Westinghouse Electric & Mfg. Co., until he retired in 1935, died at his home in Miami Beach, Fla., Jan. 10. Mr. Taylor was an employee

When there's a special metal cleaning job on hand—and most metal jobs *are* special—there's no time to be lost. One small hitch in the cleaning process can send your whole production line out of kilter. That costs money.

One sure way to avoid time-wasting production jams is to use the Wyandotte Metal cleaner most suitable for the job. You can be sure of finding the right cleaner if you'll get in touch with your Wyandotte Service Representative. He has stopped a lot of cleaning troubles dead in their tracks—and he can help you keep cleaning costs where they belong—right down in the cellar.

THE J·B·FORD COMPANY
WYANDOTTE MICHIGAN

of the Westinghouse Co. for 48 years. He was 65 years old.

❖ ❖ ❖

REGINALD B. PALMER, president of the Palmer Spring Co., Providence, died on Jan. 9 at his summer home in Saunderstown, R. I. Mr. Palmer was born in Cambridge, Mass., 42 years ago. He attended St. John's Military Academy, Manlius, N. Y., and the Culver Military Academy, Culver, Ind., and during the World War served with the American field ambulance service. Mr. Palmer established the spring company 20 years ago.

❖ ❖ ❖

MICHAEL RIESNER, consulting engineer for Worthington Pump & Machinery Corp., died suddenly at his home in Buffalo on Dec. 12. He had been identified with the Worthington organization since 1892 and served as chief engineer of the Cincinnati works for 20 years.

❖ ❖ ❖

W. NELSON MAYHEW, president of the Montgomery Iron & Steel Co., Philadelphia, died at his home in that city recently after a long illness. He was 58 years old. He had been associated with the Montgomery company for 38 years, having left college in his junior year to take a draftsman's job. He was quickly promoted until he became chief engineer and in 1928 was elected president.

❖ ❖ ❖

CHARLES M. GRIFFITH, retired vice-president of the Taylor-Wharton Iron & Steel Co., High Bridge, N. J., died in Easton, Pa., on Jan. 11, aged 70 years.

❖ ❖ ❖

WILLIAM GILBERT, president and founder of the Cincinnati Steel Castings Co., Cincinnati, died at his winter home in Orlando, Fla., on Jan. 8, after a long illness. He was 79 years old. He was also director and former president of the Buckeye Foundry Co., now headed by a son, William Gilbert, Jr., and vice-president of the Dreses Machine Tool Co., of which his other son, Charles E. Gilbert, is president.

❖ ❖ ❖

E. J. BAUR, who had been identified with the Medard Co., St. Louis, for 20 years, died on Jan. 8, aged 70 years.

❖ ❖ ❖

WILLIAM F. CHASE, purchasing agent of the Hartford Electric Steel Corp., Hartford, Conn., died on Jan. 4.

44 Tin Plate Scrap Exporters Licensed for '39

WASHINGTON — The Department of State has announced that allotments totaling 8625 gross tons were assigned on Jan. 11 to 44 producers of tin plate scrap for export under license during 1939. Applications were received from 52 companies for allotments aggregating 14,951 tons. All licenses issued during 1938 named Japan as the country of destination.

Toledo Employment 10% Above Year Ago

TOLEDO—Employment in Toledo plants is about 10 per cent above the level of a year ago, despite the post-holiday seasonal lay-off in automotive and children's vehicle industries. Fifty-one representative plants had 14,670 at work last week as compared with 13,395 a year ago, according to Toledo Associates.

STAMPED ...by PARISH

A handsomely streamlined top casing for a household stoker, stamped out of 1/16th" hot rolled steel. Measures 33 3/8th" in length, 25 3/8th" in width, and the depth at the highest point is 7 1/2". Beauty and efficiency from one sheet of steel.

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SWOC, Lacking Cash, Seen Driving for Dues Check-Off

By T. C. CAMPBELL,
Iron Age Pittsburgh Editor

PITTSBURGH—The dues collecting campaign, extended over the past year by John L. Lewis' CIO affiliate, the SWOC, indicates that the steel union is driving towards some kind of a check-off.

While some picketing has been "peaceful," at other points hundreds of workmen have been turned back from steel mill gates until dues were paid.

In some cases, actual steel finishing operations, regardless of contracts, have been suspended for a turn or retarded for a few hours. In other cases, non-union members have been detained from work while organizers tried to sign them up. When collectors began to stop workmen from entering plants, strong complaints, it is understood, were made to the SWOC.

Murray Says Hands Off

Within the past week picketing has continued outside of some plants, but cashiers have been careful to restrict their efforts to words rather than blows.

Philip Murray, SWOC chieftain, told THE IRON AGE there is no necessity for action by him because the situation was being handled by the locals affected.

That some sort of supervision may ultimately be taken by Murray before the situation gets out of hand is indicated by his statement that: "It (dues collecting) is one which will eventually be adjudicated at the top."

Meanwhile, the SWOC is trying by negotiation to make agreements including a modified dues collecting plan. Some companies have been approached by the union with a cafeteria scheme of collections, i.e., having the union collect dues on company property close to general paydays. Efforts to gain this concession so far have failed.

Miners Watch Collections

The SWOC faces indifference of its members when money is needed to carry on union activities, an issue involving contract interpretations.

Also faced by the steel union is the implied if not direct censure of union miners who have given money for establishment of the SWOC. Special levies last year on the UMW for the CIO activities, and a new one this year for UMW war chest, have some of the union mine workers wondering at the SWOC's slow dues collections.

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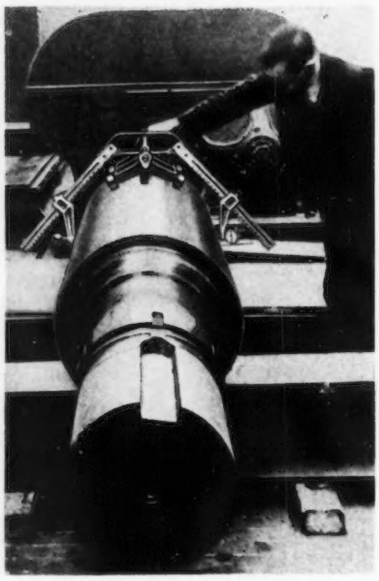

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The Farrel Caliper measures the variations in roll diameter and the amount of crown, concavity or taper. With it, roll accuracy can be checked against predetermined standards quicker than in any other way and to finer degrees of accuracy. Readings may be taken at any point along the face of the roll.

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Descriptive circular giving complete details will be sent on request

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Baltimore Warehouse Opened By Milcor Co.

MILWAUKEE—The Milcor Steel Co., Milwaukee, a subsidiary of the Inland Steel Co., is opening a warehouse at Baltimore to gain a wider distribution of its steel building materials and other products along the Atlantic Coast. Several months ago a warehouse was established at Rochester, N. Y. Besides the main plant in Milwaukee, a factory is maintained at Canton, Ohio, and branch warehouses in New York, Chicago, Atlanta, Kansas City, Mo., and La Crosse, Wis.

Ohio Works Blast Furnace on Way to World Output Record

YOUNGSTOWN — Having produced 2,530,679 gross tons of pig iron up to Jan. 1, Carnegie-Illinois Steel Corp.'s No. 2 blast furnace at the Ohio works is believed not only to have made a national record in pig iron production on a single blast furnace lining, but to be on its way to a new world record.

The furnace is still in operation, and, estimating a daily output of 1000 gross tons, production by the end of January will approximate 2,561,679 gross tons, and actual operating days will be 2995.

The total period of shutdown during this run was 92 consecutive days when the top brick work in the furnace was replaced down to 5 ft. below the stock line. No. 2 blast furnace was constructed about 1899 and was rebuilt as of May 20, 1929, from which time present operations date. It was one of the first furnaces in the country enlarged to produce approximately 1000 tons a day, an operating rate which many experts consider the most economical setup.

Veteran observers claim that the furnace is still in good shape; they expect that it will continue in operation long enough to establish a new world record, superseding the one reported to have been made by a furnace in Germany where a single lining produced over 3,000,000 gross tons.

Data on No. 2 furnace include: height, 102 ft., hearth 25 ft., and bosh, 28 ft.

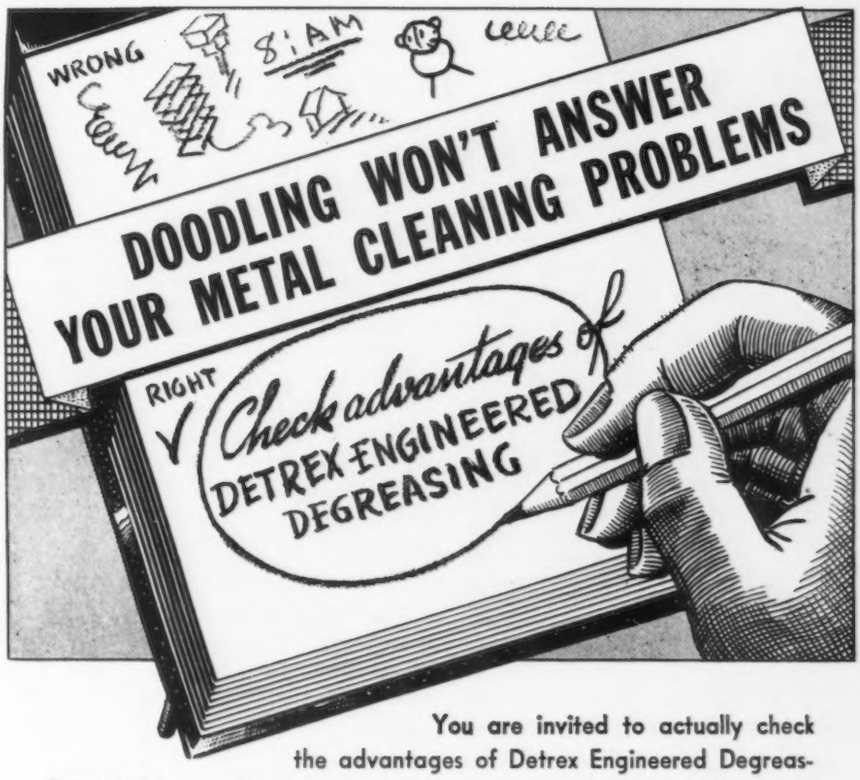
Chicago Foundrymen Plan Lecture Course

THE annual lecture course sponsored by the Chicago chapter of the American Foundrymen's Association is being held this year between Jan. 16 and April 22. The course will consist of six lectures, in the auditorium of the Peoples Gas, Light & Coke building, Chicago, and two plant visits.

The subjects and speakers scheduled for the course are: "Melting Raw Materials," by John Tissing, vice-president and secretary of Charles C. Kawin Co., Chicago; "Molding Raw Materials," by Martin Lefler, Oliver Farm Equipment Co., South Bend, Ind.; "Pattern Making and Design," by J. E. Kolb, Caterpillar Tractor Co., Peoria, Ill.; "Modern Molding Methods and Equipment in the Production of Castings," by Rex Jennings, John Deere Tractor Co., Waterloo, Iowa; "Melting Practices—Grey Iron and Malleable," by H. R. Briggs, Western Foundry Co., Chicago, and W. D. McMillan, International Harvester Co., Chicago; "Steel," by H. E. Orr, Burnside Steel Foundry Co., Chicago, and "Cleaning Methods," by Ray Wendlend, International Harvester Co.

Truscon Steel Co. Builds Mesh Plant in South

AT the Gadsden, Ala., plant of the Republic Steel Corp., work has been started on the construction of a new mesh and fabric plant for the Truscon Steel Co. The plant is expected to be ready in April.



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4 Steel Wage Minimums Set Up; Pennsylvania's Rate Is 62½c.

WASHINGTON — Modifying recommendations of the vigorously protested majority report of the Public Contracts Board, Acting Secretary of Labor Charles V. McLaughlin on Monday issued a final order prescribing four minimum hourly wage rates for the iron and steel industry, ranging from 45c. to 62½c., effective Jan. 31.

The order set up six districts and recognized some of the complaints from sections of the industry against the majority report, which proposed only two wage districts, with 45c. applying to 12 southern states and 62½c. for the remainder of the country.

The order fixed 45c. for 13 southern states, adding West Virginia, except the Panhandle of that state, in which the largest productive capacity lies; 60c. for Pacific Coast states; 60c. for western mountain states; 58½c. for seven middle western states, and including only that part of Illinois comprised of the East St. Louis area and 62½c. for the remainder of the country. Thus, the order disregarded strong objections from eastern producers, whose top minimum rate is 56½c. They insisted that there should be no increase over this rate.

The order to a considerable degree, though not entirely, follows recommendations made in a minority report of the board by O. R. Strackbein. Mr. Strackbein proposed five areas and among other recommendations suggested a 56½c. rate for the East—that section lying east of Altoona, Pa., and extending south to the Virginia line.

What Order Specifies

The order of the Acting Secretary of Labor established the following rates and areas:

1. 45c. per hr. in the states of Louisiana, Arkansas, Mississippi, North Carolina, South Carolina, Florida, Oklahoma, Texas, Alabama, Tennessee, Georgia, Virginia and West Virginia (except the counties of Hancock, Brooke, Ohio, Harrison, Monongalia and Marshall).

2. 60c. per hr. in Washington, Oregon and California.

3. 60c. per hr. in Montana, Idaho, Nevada, Wyoming, New Mexico, Utah, Colorado and Arizona.

4. 58½c. per hr. in North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa, Missouri, and the area in and about East St. Louis, Ill.

5. 62½c. per hr. in Wisconsin, Illinois (except the area in and about East St. Louis, Ill.), Michigan and Indiana.

6. 62½c. per hr. in Ohio, Pennsylvania, Delaware, Maryland, Kentucky, New Jersey, New York, Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire, and Maine, and that portion of West Virginia including the counties of Hancock, Brooke, Ohio, Marshall, Harrison, and Monongalia, and the District of Columbia.

The order provided that apprentices may be employed at lower rates if their employment conforms to the standards of the Federal Committee on Apprenticeship.

Wheeling, Weirton Affected

In the six West Virginia counties which are included in the 62½c. area are located plants of the Wheeling Steel Corp., the Weirton Steel Co., and the idle sheet mill of the Carnegie-Illinois Steel Corp., the latter at Morgantown. At the same time the order in putting the remainder of West Virginia in the southern area shifts the Parkersburg Iron & Steel Co., Parkersburg, and the West Virginia Rail Co., Huntington, to the 45c. rate instead of the 62½c. wage which was proposed in the majority report of the board.

In establishing the 60c. rate for the Pacific Coast and the western mountain states the order recognized complaints from those sections, especially that of the Colorado Fuel & Iron Corp., Pueblo, Colo. The 58½c. rate for such producing sections as Kansas City and St. Louis, Mo., and East St. Louis also is a concession demanded by producers at those points who were included in the 62½c. area in the majority report. Some southern independent producers had urged continuance of the rate of 40c. which they now pay, but the order ignored their contention and fixed the rate at 45c.

Objections Reviewed

Mr. McLaughlin reviewed in the 19-page decision most of the objections made by representatives of the steel industry during and following the hearings held late in July.

The order flatly turned down the request that eastern mills be allowed a wage differential with the statement that "the entire eastern market, frequently referred to in the industry as the Pittsburgh district, would seem to constitute a single locality, both in terms of geography and in terms of the markets predominantly served by the producing plants."

Mr. McLaughlin cited a statement made by Myron Taylor in his annual report to the stockholders of the United States Steel Corp., on April 4, 1938, in substantiation of the contention of the Labor Department that the iron and steel industry does not regard itself as subdivided in a multiplicity of small localities, but rather as concentrated around a few well-defined centers.

Protests Found "Without Merit"

To the objections made by some steel spokesmen that failure of the Public Contracts Board to consider differences in population and plant size in recommending minimum wage rate would work a hardship on them, the wage order characterized these protests as "without merit" since, according to the decision, the act makes provision for the establishment of neither plant size nor population differentials. The order suggested, however, that in the case of small companies which have protested against paying the same rate as their larger competitors and which supply the Government with "steel specialties," an analysis be made of their status under future contracts so that Section 6, the provision of the law which allows exemption under certain circumstances, "may be called into operation upon a proper showing that the public interest would thereby be served." It was indicated that experimental contracts would not be affected by the order.

In explanation of the inclusion of West Virginia, except for the Panhandle area, with the southern district, the order noted that the state is closely allied with the South and that the section is understood to be outside the Pittsburgh market area.

Coast States "a Locality"

The coastal states of Washington, Oregon and California, the labor secretary explained, seem to constitute a fairly well-defined geographical locality, segregated from competition by land from the East, and competing and serving a more or less well-defined local market.

Likewise in the case of the eight mountain states of Montana, Idaho, Nevada, Wyoming, New Mexico, Utah, Colorado and Arizona in which the order prescribed a minimum wage of 60c., the decision said a combination of economic and geographic considerations leads to the conclusion that the area may properly be regarded as a separate locality within the meaning of the law.

60c. in Seven States

It was asserted that the area encompassed by the seven mid-western states and which covered only that part of Illinois comprising the East St. Louis area, include plants operating over a long period of years with a wage differential below the rate paid in the northern and eastern centers, but higher than the rates paid in the South. The order, therefore, fixed a 60c. minimum rate in that area.

The labor secretary determined that the area immediately to the east of the trans-Mississippi locality in which a 62½c. rate was fixed is dominated by the producing centers in and about Chicago and Gary, Ind. The states of Wisconsin, Illinois (with the exception noted above), Michigan and Indiana, the decision noted, constitutes a fairly well-defined locality both in terms of geography and in the light of the concentration of production.

Wet or Dry?

INFORMATION is desired by a reader concerning the general trend with regard to the installation of diesel engine liners. He wishes to know whether the new designs call for the installation of "dry" or "wet" cylinder liners, and in either case what are the outstanding advantages or disadvantages.

We will be pleased to hear from our readers on this point.

Harbor Planned Near National Steel Corp.'s Indiana Property

CHICAGO.—The much discussed new Lake harbor for Indiana, to be located where Burns ditch empties into Lake Michigan three miles east of Gary, is back in the news again.

The State Legislature is being asked to take action at its present session by civic, industrial and labor groups of the counties which would be affected. Any improvements at this site are of great interest to the steel industry because the National Steel Corp., through a subsidiary, the Midwest Steel Corp., owns 760 acres on the east side of Burns ditch and 240 acres on the west. The company bought the property 10 years ago to provide for future expansion.

The Burns ditch site is the only one on the Indiana shore still available for harbor development. War department engineers have approved the plans and it is believed the necessary work, building of breakwaters, dredging a channel 300 ft. wide and 1000 ft. long south from the shore into the ditch, could be accomplished for about $3,000,000. The ditch now is 220 ft. wide at the mouth and 110 ft. wide where it joins the Calumet River.

Cleveland-Cliffs Will Refund $13,230,000 Bonds

CLEVELAND.—Directors of the Cleveland-Cliffs Iron Co. will submit to stockholders, Feb. 2, a plan for refunding $13,230,000 4¾ per cent bonds. It is planned to redeem the present bonds March 15 at 105.

France Sells Skoda Works To Czechoslovakia

LONDON (*By Mail*)—It is officially announced that in view of the changed political situation in Central Europe the Schneider-Creusot group of France, which has hitherto held the controlling interest in the Skoda works, Central Europe's largest armament enterprise, has turned over its interests to a Czechoslovakian group representing the Czech Government. The Schneider-Creusot group was represented in Prague by the holding company, Union Europeenne.

Recent rumors that Germany was taking over the Skoda works were strenuously denied, as well as reports that German engineers were already in charge of production. The present announcement does not explain whether the Czechoslovak State, which already had large minority holdings in Skoda, retains the newly-acquired stocks, thus becoming virtually the sole owner, or whether a part of that interest will be turned over to another foreign group—perhaps German. The nominal capital of Skoda is 220,000,000 Czech crowns.

Car Wheel Makers Back Battelle Research

THE Association of Manufacturers of Chilled Car Wheels has established a research project at Battelle Memorial Institute on chilled irons for use in car wheels, according to an announcement by F. H. Hardin, president of the association, and Clyde E. Williams, director of Battelle Memorial Institute. The work will comprise a critical study of the material in current use and of new compositions in the iron carbon group of metals.

Armstrong Cork Adopts Annual Wage Guarantee

ARMSTRONG CORK CO. has broadened its income security program for Pittsburgh district employees to assure workers with the company five or more years an income equal to 25 hr. work per week during 1939, whether or not they are employed that length of time, H. W. Prentis, Jr., president, announced.

Armstrong Cork has increased its unemployment reserve fund to $400,000 and ordered workers with one to five years' service be given unemployment compensation before state compensation begins. The company has paid $90,000 since 1935 to workers who otherwise would have had no financial assistance during the period of adjustment caused by layoffs.

Britain Buys Steel for Air Raid Shelters

LONDON, Jan. 17 (*By Cable*).—The British Government has placed an initial order for 100,000 tons of galvanized corrugated sheets and 20,000 tons of steel channels for air raid shelters.

. . . PERSONALS . . .

FREDERICK H. DORNER, JR., has joined his father, Frederick H. Dorner, in the practice of mechanical engineering and equipment selling. Like his father, Mr. Dorner is a graduate of the college of engineering of the University of Wisconsin. He then spent five years in the engineering department of the Milwaukee Sewerage Commission. Early in 1938 he entered the Buell Engineering Co. staff in New York, following which he went to Europe to inspect power plants and general process works, returning early this year.

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H. S. LEWIS, of Price Iron & Steel Co., Chicago, has been elected first vice-president of the Chicago chapter of the Institute of Scrap Iron and Steel, Inc. A. J. CLONICK, of the Clonick Steel Co., has been made second vice-president; FRANK PARKER, of Iron & Steel Products, Inc., third vice-president; HARVEY KAPLAN, of M. S. Kaplan Co., is secretary, and HENRY ROSENTHAL, of Briggs & Turivas, treasurer. MAX SCHLOSSBERG has been reelected president.

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WILLIAM M. RECTOR, heretofore district sales manager, for the Weirton Steel Co., in Rochester, N. Y., has been appointed district sales manager in New York. W. E. SNELLGROVE, assistant district sales manager, New York, has been appointed district sales manager in Rochester.

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L. H. WILLIAMS, of Williams Hardware Co., Minneapolis, has been elected president of the Northwest chapter of the American Steel Warehouse Association. JOSEPH PAPER, of Paper, Calmenson & Co., St. Paul, is vice-president, and WINTER DEAN, of Nicols, Dean & Gregg, St. Paul, secretary.

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KARL A. OSTLING, formerly in charge of industrial engineering of the Pontiac division, General Motors Corp., has been made vice-president in charge of production for Carrier Corp., Syracuse, N. Y. L. R. BOULWARE has resigned as vice-president and general manager but will continue as director. Two other changes in the corporation are the appointment of EDWARD T. MURPHY, vice-president in charge of central district, to become vice-president in charge of marketing. JAMES A. BENTLEY, vice-president and head of International division, will become vice-president in charge of finance.

Pittsburgh Steel Co. Is Closing Two Warehouses

PITTSBURGH — Pittsburgh Steel Co. is discontinuing its Memphis and St. Louis warehouses and is closing down its district sales office at Memphis. It is understood the present low prices on merchant wire products, particularly nails and barbed wire, in conjunction with substantial freight absorption from the company's plants at Pittsburgh, have dictated this move.

According to the company, the warehouse stocks of merchant wire products will be liquidated in an orderly manner. Pittsburgh Steel will continue the sales of certain wire products such as woven wire field and poultry fencing, lawn fencing, and manufacturers' wire in the St. Louis and Memphis districts.

Heat Diffusing Units Used In Cable Dehydrating Ovens

TEMPERATURES above boiling point are automatically maintained in dehydrating ovens today of the Habirshaw Cable & Wire Corp., Yonkers, N. Y., to remove all moisture from reels of 10-ton lead cable before they are shipped. High temperatures are produced by Carrier heat diffusing units placed in each of six ovens. The ovens are really rooms with a "portable" roof. At the temperatures used all moisture becomes vapor which is slowly drawn off with a vacuum pump attached to the end of each cable. Dehydrating period is about one week.

Weirton Steel Co. Will Build $250,000 Laboratory

GROUND will be broken Feb. 1 for Weirton Steel Co.'s new laboratory building in Main Street, Weirton, W. Va., opposite the company's general office building.

Construction and equipment of the structure will require an estimated $250,000 and will provide an approximate total of 90,000 man-hours of employment. The laboratory will be the administrative center of the steel company's chemical, metallurgical and research departments and will be ready for occupancy within six months.

T. E. Millsop, president of Weirton Steel, pointed out that there is practically no limit to the variety of chemical and physical properties that may be given to steel.

"One of the most important functions of our chemical, metallurgical and research staffs," he said, "is to help steel consumers work out from thousands of possible variations the particular kinds of steel best adapted to their needs. The expansion of this work—known as quality control work —and the normal increases in the size of our chemical and metallurgical staffs have necessitated the additional space and equipment."

French Raise Steel Prices; First Advance Since 1937

LONDON (*By Mail*).—The French National Price Control Committee has granted in part the application of the iron and steel industry for an increase in the price of steel products. Pending a thorough inquiry into cost prices, the committee has agreed to authorize a 10 per cent rise in the price ruling in November, 1937—that is, 100 fr. per ton on rolled steel.

This is the first French price increase since November, 1937, and the first practical implication of the Daladier Government's policy to free the industry from the strict price control to which it has been subject for the past two years.

Japanese Expanding Chinese Pig Iron Output

PLANS of the Japanese Government and private interests for expanding the production of iron ore and pig iron over the next four years in North China include putting into blast a 250-ton furnace near Peiping and similar projects, now partly complete, in Shansi Province, according to the American Commercial Attache at Shanghai in a report to the Department of Commerce. As a result of this expansion, 140,000 tons of pig iron production will be added to China's annual capacity. Plans for iron ore output in southern Chahar envisage 2,000,000 tons annually by 1941.

Sterling Electric Motors, Inc., of Los Angeles, manufacturers of Slo-Speed and Speed-Trol motors, have opened direct factory offices temporarily at 81 San Miguel Street, Springfield, Mass. Allen A. Adams, treasurer and director of the company, will act as eastern manager. To insure quicker deliveries, adequate stocks of apparatus are now being carried at several eastern points.

REINFORCING STEEL

. . . Awards of 19,755 tons— 3900 tons in new projects.

AWARDS

825 Tons, Kenova, W. Va., flood wall, to West Virginia Rail Co., Huntington, W. Va.

600 Tons, Middletown, Conn., State hospital, to Truscon Steel Co., New York, Scherer Steel Co., West Hartford, Conn., contractor.

500 Tons, Rumson, N. J., Oceanic bridge, to Concrete Steel Co., New York.

490 Tons, Jersey City, N. J., Lincoln tunnel approach, to Ceco Steel Products Corp., Jersey City, N. J.

380 Tons, Jamaica, L. I., Plum Beach Channel bridge, to Jones & Laughlin Steel Corp., Pittsburgh, through Arundel Corp., Baltimore, contractor.

350 Tons, Pittsburgh, Saw Mill Run Boulevard and W. Liberty Avenue, grade elimination, to Jones & Laughlin Steel Corp., through the Trimble Co., Pittsburgh, contractor.

300 Tons, Pittsburgh, Columbus Avenue sewer, to Jones & Laughlin Steel Corp., through Electric Welding Co., contractor—Thomas, Pittsburgh.

300 Tons, Pittsburgh, Negley Avenue sewer, to Jones & Laughlin Steel Corp., through W. N. Dambach, Inc., Mike Manella, Pittsburgh, contractor.

270 Tons, Woodbridge, N. J., Raritan River bridge, to Truscon Steel Co., Youngstown, through Fulhaver Construction Co., Newark, contractor.

265 Tons, New York, Farmers Boulevard grade elimination, to Truscon Steel Co., Youngstown.

265 Tons, Woodbridge, N. J., grade elimination, to Truscon Steel Co., Youngstown.

250 Tons, New York, Queens Parkway highway grade separation, to Bethlehem Steel Co., Bethlehem, Pa., through A. W. Banko Co., Inc., New York, contractor.

225 Tons, Allentown, Pa., Hanover Acres Housing Development, to Bethlehem Steel Co., through Stofflet & Tillotson, Philadelphia, contractors.

200 Tons, Buffalo, Willet Park Housing Development, to Bethlehem Steel Co., through Fleisher Engineering & Construction Co., Buffalo, contratcor.

200 Tons, Providence, R. I., police and fire station, to Truscon Steel Co., Boston; N. E. Concrete Co., Providence, contractor.

200 Tons, New York, highway project in Bronx, to Joseph T. Ryerson & Son, Inc., Jersey City, N. J.

165 Tons, Philadelphia, Ashburner Street grade elimination, Pennsylvania Railroad, to Jones & Laughlin Steel Corp., through Taylor-Davis, Inc., Philadelphia, Yeo Construction Co., Chestnut Hill, Pa., contractor.

150 Tons, Baltimore, Naval Academy Hospital, to Bethlehem Steel Co., through John McShain, Philadelphia, contractor.

150 Tons, Paterson, N. J., school, to Ceco Steel Products Corp., Jersey City, N. J.

132 Tons, Williamsburg, Va., Barrett's Ferry Street bridge, to Bethlehem Steel Co., through Hall-Hodges, Inc., Norfolk, Va.

125 Tons, Charleston, W. Va., Kanawha Boulevard extension, to West Virginia Rail Co., through Stellhorn & Beightler, Columbus, Ohio, contractor.

100 Tons, Passaic County, N. J., highway bridge, to Bethlehem Steel Co., Bethlehem, Pa.

CENTRAL AND WESTERN STATES

2460 Tons, Coram, Cal., Shasta power plant (Invitation E-37461-A), to Bethlehem Steel Co., San Francisco.

1400 Tons, Pasadena, Cal., city invitation, to Bethlehem Steel Co., Los Angeles.

1120 Tons, Los Angeles, Metropolitan Water District, to Bethlehem Steel Co., Los Angeles.

840 Tons, Youngstown, Ohio, housing project, to Concrete Steel Co., Chicago, through Youngstown Builders Syndicate.

700 Tons, Alhambra, Cal., Mark Keppel High School, to Ceco Steel Products Co., Los Angeles.

520 Tons, Waverly, Ohio, Pike County highway bridge, to West Virginia Rail Co., through Purdy Construction Co., contractor.

500 Tons, Saginaw, Mich., Arthur Hill high school, to Bethlehem Steel Co., through Bryant & Detwiler, contractors.

500 Tons, Steubenville, Ohio, high school, to Bethlehem Steel Co., through I. Barnes, Springfield, Ohio, contractor.

486 Tons, Cleveland, rail steel bars for Veterans Hospital, to Bethlehem Steel Co., Bethlehem, Pa., through Lundoff-Bicknell Co., Cleveland.

400 Tons, Sandusky, Ohio, water works, to Pollak Steel Co., Cincinnati, through National Construction Co., Cleveland, contractor.

400 Tons, Kalamazoo, Mich., State hospital, to Calumet Steel Co., Chicago.

398 Tons, Sacramento, Cal., water tank, to Bethlehem Steel Co., San Francisco, through Campbell Construction Co., Sacramento, contractor.

376 Tons, Cincinnati, sewer, to Joseph T. Ryerson & Son, Inc., Chicago.

350 Tons, Cincinnati, municipal garage, to Truscon Steel Co., through Penker Construction Co., Cincinnati, contractor.

300 Tons, Kalamazoo, Mich., receiving hospital, to Calumet Steel Co.

260 Tons, Denver, Montclair reservoir, to Denver Steel & Iron Works; through J. T. McDowell, Denver, contractor.

218 Tons, Saticoy, Cal., bridge reconstruction, to Ceco Steel Products Co., Los Angeles; through Paul J. Tyler, Oroville, Cal., contractor.

199 Tons, Riverside, Cal., Pedley Bridge, to Consolidated Steel Corp., Los Angeles; through White & Wilberg, Santa Monica, contractor.

170 Tons, Rockford, Ill., school, to Calumet Steel Co.

130 Tons, Gary, Ind., Wirt Memorial School, to Concrete Steel Co., Chicago.

124 Tons, Ventura, Cal., water softening plant, to Blue Diamond Corp., Los Angeles.

113 Tons, Corbett, Wyo., Shoshone project (Invitation C-10141), to Youngstown Sheet & Tube Co., Youngstown, Ohio.

104 Tons, San Francisco, Olympic garage, to Soule Steel Co.

101 Tons, Los Angeles, John Adams Junior High School, to Consolidated Steel Corp., Los Angeles.

100 Tons, Wilmington, Cal., transit shed, to Truscon Steel Co., Los Angeles; through William P. Neil, Los Angeles, contractor.

The following items were erroneously listed last week under structural steel awards:

459 Tons, Madison, Wis., 292 tons for Washington school and 207 tons for Burroughs school, to Joseph R. Ryerson & Son, Inc., Chicago, through J. H. Findorf & Son, Madison.

190 Tons, Plainfield, Ind., boys' dormitory, to W. J. Holiday & Co., Chicago, through Henke Construction Co., Chicago.

157 Tons, Terre Haute, Ind., fine arts building, to Joseph T. Ryerson & Son, Inc., Chicago, through James McHugh Sons, Inc., Chicago.

133 Tons, Marinette, Wis., hospital, to Bethlehem Steel Co., Bethlehem, Pa., through Hutter Construction Co., Fond du Lac, Wis.

103 Tons, Waukesha, Wis., bridge, to Joseph T. Ryerson & Son, Inc., Chicago, through Bentley Construction Co., Milwaukee.

PENDING REINFORCING BAR PROJECTS

NORTH ATLANTIC STATES

275 Tons, Jersey City, N. J., mats and bars, approach, Lincoln tunnel, J. P. Scanlon, Jersey City, N. J., general contractor.

115 Tons, Whitestone, N. Y., Whitestone Parkway project, S. J. Groves & Son, Ridgefield, N. J., general contractor.

100 Tons, Queens, N. Y., Cross Island Parkway project.

CENTRAL AND WESTERN STATES

748 Tons, San Francisco, bridge approach viaducts; bids Feb. 1.

480 Tons, Port Huron, Mich., city hall.

425 Tons, Toledo, Ohio, Weiler housing development.

361 Tons, Los Medanos, Cal., Central Valley project (Invitation B-47440-A); bids Jan. 19.

350 Tons, Detroit, apartment building.

260 Tons, Los Medanos, Cal., Central Valley project (Invitation B-47441-A); bids Jan. 20.

225 Tons, Lafayette, Ind., Purdue University music hall.

210 Tons, Clatsop County, Ore., Nehalem River bridge; bids Jan. 26.

200 Tons, Mount Pleasant, Mich., electric plant.

151 Tons, Albany, Ore., overcrossing; bids Jan. 26.

Unstated tonnage, Riverside, Cal., post office; bids Feb. 17.

Unstated tonnage, Indianapolis, livestock pavilion.

Largest Mine Hoist Induction Motor

A 2500-hp. induction motor and control supplied for the Tennessee Coal, Iron & Railroad Co. and put in operation during 1938 is the largest induction motor driving a mine hoist in America, according to Guy Bartlett, General Electric Co. Reversing contractors having a continuous capacity of 1000 amp. at 2500 volts were necessary. They are operated by d-c solenoids. The entire control is d-c operated and the acceleration is of the definite time limit type. The rope speed is exceptionally high for slope work, 3600 ft. per min. hoisting and 3300 ft. per min. lowering. As it was not considered safe to lower the empty car at more than 3300 ft. per min. regenerative braking was precluded and dynamic d-c braking is used.

Montana Copper Mine Closed by Anaconda

DUE to excessive stocks, the Anaconda Copper Mining Co. has indefinitely suspended operations at its Leonard mine in Butte, Mont. Approximately 900 men were affected. Two zinc concentrating units at the Washoe plant were also closed down.

. . . THE NEWS IN BRIEF . . .

Automobile production climbs to 86,925, exceeding 1937 and 1938 output—new and used car inventory conditions rated satisfactory—Studebaker to introduce light car in March.—**Page 46.**

President Roosevelt's national defense message is found reasonable by some Congressmen; opposition to be tempered.—**Page 50.**

National Labor Relations Board has "indorsed" lynch law in its rehiring order, Fansteel Metallurgical attorney declares.—**Page 53.**

Frank Murphy reveals his warning to CIO in Michigan strikes as defense of his policy on sitdowns.—**Page 54.**

Second FTC and Justice Department questionnaire for steel producers is ready for mailing.—**Page 56.**

Machinery awards by Federal Government departments mount to $1,941,505 in latest reported week.—**Page 56.**

American Gear Manufacturers Association forms a committee to study standards for oils, greases and special lubricants.—**Page 58.**

Reliance Steel Corp., Cleveland, buys Sheet Metal Mfg. Co., of Youngstown, headed by Thomas J. Farrell.—**Page 58.**

Film demonstrating artificial lightning is made by General Electric for sealing in Georgia school's "Crypt of Knowledge."—**Page 59.**

Minneapolis plans barge terminal for scrap shipments down Mississippi River.—**Page 59.**

Carnegie-Illinois Steel Corp. gives its Scottdale, Pa., works to a nonprofit community organization.—**Page 59.**

Employment in 51 Toledo, Ohio, plants runs 10 per cent above year ago despite layoffs.—**Page 61.**

SWOC, lacking cash as members fail to pay dues, opens campaign for some type of check-off system, bars workmen from some Pittsburgh mills.—**Page 62.**

Milcor Steel Co., Milwaukee, opens a warehouse at Baltimore to gain wider distribution of its steel building materials on Atlantic Coast.—**Page 62.**

Truscon Steel Co., Republic Steel Corp. subsidiary, builds mesh and fabric plant at Gadsden, Ala.—**Page 63.**

Carnegie-Illinois Steel Corp.'s No. 2 blast furnace at Youngstown moves toward world production record, now believed held by German stack.—**Page 63.**

Lewis Welding & Engineering Corp. is organized at Cleveland with James T. Lewis, Jr., as president.—**Page 69.**

Exports of power-driven metalworking machinery for last October gain a third over exports of the like month of 1937.—**Page 69.**

Detroit Section of the American Welding Society hears address by Air Reduction sales executive on "Flame De-scaling."—**Page 69.**

Steel Founders Society of America establishes an annual Frederick A. Lorenz memorial medal for the industry's outstanding individual.—**Page 69.**

SECTIONS INDEX

Personals	44
Obituary	60
Fabricated Steel	72
Steel Ingot Production	73
Summary of the Week	74
Comparison of Prices	75
Pittsburgh, Chicago, Cleveland, Philadelphia and New York Markets	76
Non-ferrous Market	81
Scrap Market and Prices	82-83
Finished Iron & Steel	84-85
Pig Iron & Raw Material Prices	86
Warehouse Prices	87
Machine Tool Activity	90
Plant Expansion & Equipment	88

MEETINGS

Feb. 9 to 11—Conference of iron, steel and allied industries, Del Monte, Cal.

Feb. 14—Foundry Equipment Manufacturers Association, Cleveland.

Feb. 14 to 17—Purchasing Agents Association, Indianapolis.

April 26 to 29—Electrochemical Society, Columbus, Ohio.

Plan proposed for gathering of statistics by the Government.—**Page 70.**

Plates and various shapes of speed case X-1515 now being offered to the trade.—**Page 70.**

American Foundrymen's Association Detroit chapter members hear address on core room control.—**Page 71.**

Engineering construction awards placed in the week ended Jan. 14 totaled $119,726,000, highest since May 15, 1930.—**Page 71.**

Foundry Equipment Manufacturers Association plans its annual meeting for Feb. 14 at the Terminal Club, Cleveland.—**Page 71.**

Inland Steel Co. licenses Youngstown Sheet & Tube Co. to produce lead-bearing steel under Ledloy patents.—**Page 71.**

Four steel wage minimums are set up by Labor Department; rate in Pennsylvania, Ohio, Maryland, West Virginia Panhandle fixed at 62.5c. on Government business.—**Page 63A.**

Members of the Association of Manufacturers of Chilled Car Wheels set up a research project on chilled irons at Battelle Memorial Institute.—**Page 63B.**

France sells Skoda works to Czechoslovakia.—**Page 63B.**

Armstrong Cork Co. adopts plan guaranteeing Pittsburgh workers a 25-hr. per week income during 1939.—**Page 63B.**

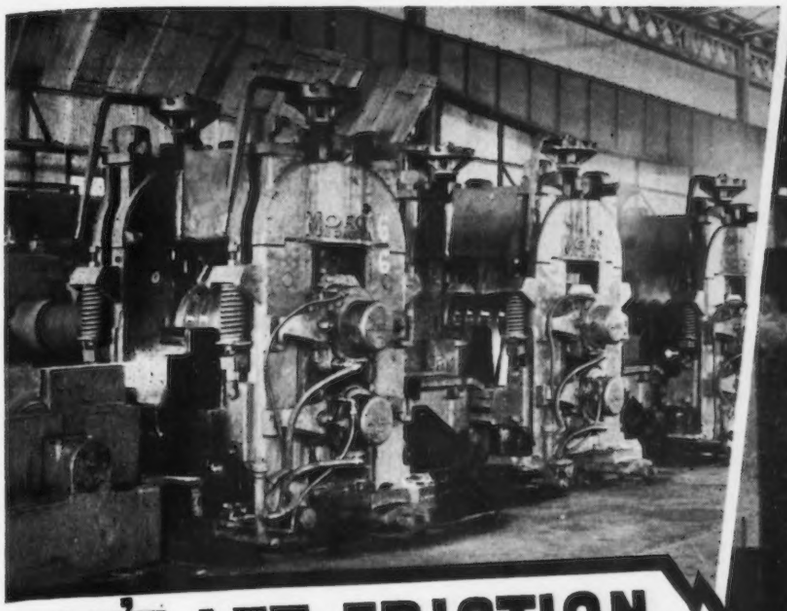
Indiana Legislature is asked to improve lake harbor near National Steel Corp.'s 1000-acre site in vicinity of Gary.—**Page 63B.**

Weirton Steel Co. announces plans for building a new $250,000 laboratory in Weirton, W. Va.—**Page 63C.**

Shipments of trackwork for T-rail track totaled 34,710 tons in 1938, a 62 per cent drop from the 1937 total of 92,121 tons.

Chicago Chapter of the American Foundrymen's Association sponsors a course including six lectures, two plant visits.

Forty-four exporters of tin plate scrap are licensed by the State Department to ship abroad during 1939.



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R-49

Let MORGAN WORCESTER ENGINEERS AND MANUFACTURERS *Remove the Lags*

Joseph E. Jacobson Elected Head Of Scrap Dealers' Association

JOSEPH E. JACOBSON of Luria Brothers & Co., Pittsburgh, was elected president of the Institute of Scrap Iron and Steel at the annual convention held in St. Louis, Jan. 10-12, succeeding Michael Bonomo of Schiavone-Bonomo Corp., New York. Louis J. Borinstein of A. Borinstein, Indianapolis, was elected vice-president; George Sturn, Middletown Iron & Steel Co., Middletown, Ohio, secretary; Thomas F. Kelly, Brooklyn, treasurer, and Edwin C. Barringer, New York, executive secretary.

Nine members at large of the board of directors were elected as follows: Benjamin Schwartz, Schiavone-Bonomo Corp., New York, N. Y.; Darwin S. Luntz, Luntz Iron & Steel Co., Canton, Ohio; Philip W. Frieder, the Philip W. Frieder Co., Cleveland; Charles Dreifus, Jr., Charles Dreifus Co., New York; William J. Ross, Hyman-Michaels Co., Chicago; Frank Gordon, Harcon Corp., Boston; Alvin A. Wolff, Wolff Pipe & Iron Co., St. Louis; Harry Grant, Grant Iron & Metal Co., Detroit; Edward L. Solomon, Max Solomon Co., Pittsburgh. These with the presidents of 19 chapters of the institute constitute the board of directors.

JOSEPH E. JACOBSON, new president of Institute of Scrap Iron and Steel.

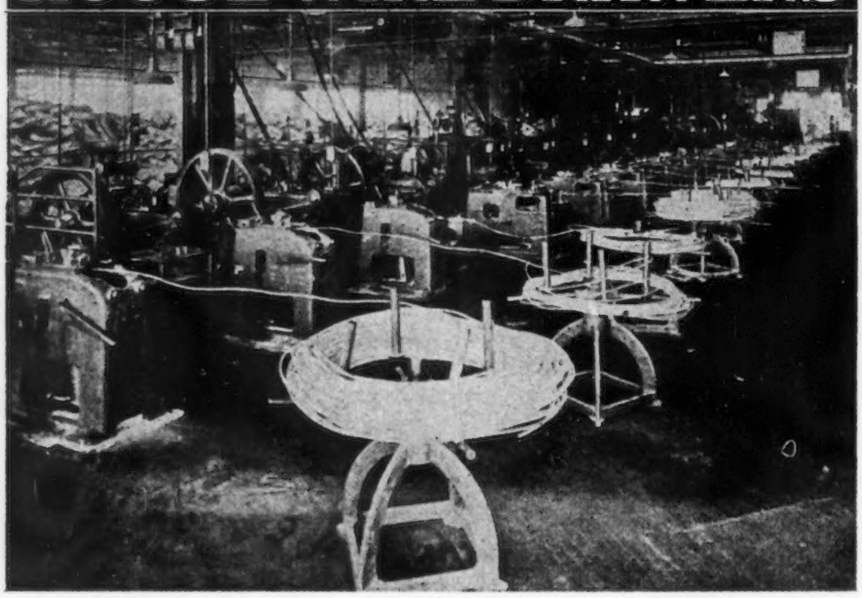
The attendance at the convention, numbering about 400, was the largest since the institute was formed more than a decade ago. The present membership is 735. The next convention will be held in Pittsburgh in January, 1940.

Balers Division Formed

One of the acts of the convention was the formation of a balers' division of which S. H. Bassow, Bassow Brothers, New York, was elected chairman. This division will operate to improve the quality of No. 2 bundles and to obtain further usage of these bundles. A proposal was made that each shipper of hydraulic bundles adopt a distinctive mark which could be applied with paint or in some other manner so that any steel company can determine the deri-

AJAX

HOGUE WIRE DRAWERS



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Installation on any cold header is simple; the only connection to the header being a roller chain sprocket on the crankshaft. It is not operated from any light auxiliary mechanism of the header. It is easy to set up for different jobs, simple to operate, and does not cause difficulties in gauging.

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vation of the bundles in its scrap yard. It was also decided to conduct a series of experiments with different types of bundles to determine the metallurgical effect of various non-ferrous materials which cannot easily be separated in the bundling process. When the results of these experiments are known an educational campaign will be conducted among steel scrap users.

There was considerable discussion at the convention of the code of ethics adopted by the St. Louis chapter in an effort toward the further elimination of undesirable practices in the marketing of scrap. One of the points stressed was that the financing of small dealers by large brokers has been the cause of some of the unethical practices which the institute is trying to eliminate.

Discusses Business Situation

Louis J. Borinstein, Indianapolis, who for many years has been president of the Indianapolis Chamber of Commerce, read a thoughtful paper on present business and political conditions under the title "Industry's Opportunity and Responsibility." Among some of his most interesting comments were these:

"Government, through legislative enactments and administrative regulations, has so pervaded the functioning of business that business cannot continue to exist—and by that I mean operate at a profit—unless it, first, arrives at a full and complete understanding of the problems that are thus created; second, makes its position on such problems fully understood; and, third, undertakes in every lawful and ethical manner to have its judgment and experience bear upon the governmental actions with which it is involved.

"There have been numerous addresses at business men's conventions, numerous magazine articles addressed for the reading of business men, indicting them on the score of failure to keep the public informed as to their problems and convictions. Often this scolding has been pretty general, and not particularly helpful to the business man struggling with a new aspect of his business with which he has never before had to cope. We need, as business men, to understand in just what specific ways we have failed to meet our problems.

"I have no doubt, for example, that business problems would be better understood today if we had carried on, as employers, a more reasonable attitude toward publicity in labor disputes. The employer has, in many instances, lost the public support which the strength of his position should have assured him, simply because of his inability to handle the public relations aspect of the problem. Preachment on this has done some good, for in many instances during the past few years, the employer has, within the bounds of propriety, informed the public of the basic issues that were involved in his controversy and has exercised extreme care not to violate the public's interest, which is involved in almost any labor dispute.

"We must admit, however, that we have failed seriously, in bringing to bear the influence of our experience and understanding of economic and business problems upon the laws which government has been passing which so vitally harass and endanger our economic system. We have done a very poor job, indeed. It should have been clear three years ago that the Wagner Labor Relations Act, then proposed in Congress to diminish labor disputes, would, quite to the contrary, only enkindle more strikes,

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THAT'S how BCA Ball Bearings run whether they are helping a "Caterpillar" tractor clear a 4-foot snow in Colorado, a speed boat make a record in Florida or a milling machine cut a piece of alloy steel in Ohio. You'll find BCA Ball Bearings used in many of the finest machines in industry. Thorough investigation is sure to put them on your own "approved list." Write for an appointment with a BCA engineering representative. BEARINGS COMPANY OF AMERICA, 512 HARRISBURG AVENUE, LANCASTER, PENNSYLVANIA.

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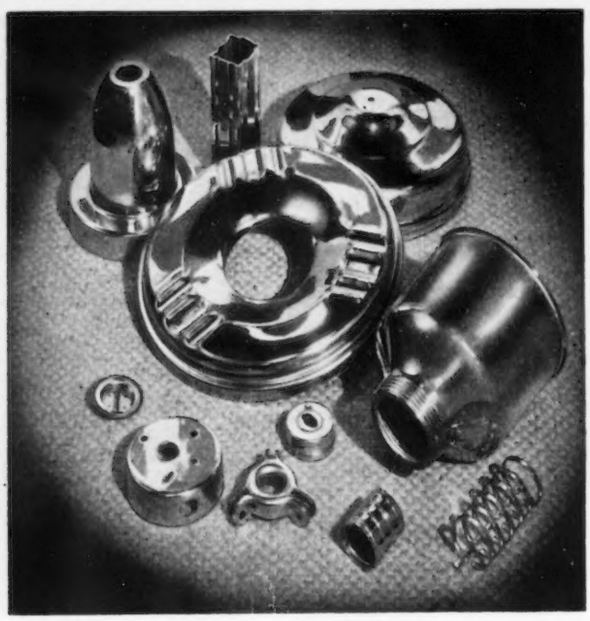
BALL BEARINGS

more lost time, more violence and a more general economic disruption and retardation. It should have been clear even less than a year ago that the attempt by legislation to place a floor below wages and a ceiling above hours of work was much more complex than it appeared to be on the surface; that it involved a great deal more of confusion and difficulty for the orderly conducting of a business than simply to fix limits below which wages could not go and above which hours of employment could not climb. Especially should that have been expected to result in view of the disastrous experience of the NRA. Yet, in these and similar issues, of the greatest importance to all our people, business as a whole has been too ineffective. Literally scores of laws have been passed at Washington and in the state capitals which hamper and hamstring business to such a degree that it is a real wonder that our country enjoys any prosperity.

INCREASED PRODUCTION
FOR THE ASKING



By asking Thomas engineers to work on their problems, many manufacturers have paved the way to increased production. In some cases, cold strip... matched to the job... meant more products. The use of Thomas special finishes often resulted in definite savings by eliminating operations or replacing more expensive metals. Ask the Thomas engineers to call on you. Their services may lead to increased production in your plant.

Bright Finish Uncoated
Electro Nickel Coated
Electro Zinc Coated
Electro Brass Coated
Electro Copper Coated
Electro Bronze Coated

Thomas Strip — Cold Rolled Strip Steel

THE THOMAS STEEL COMPANY • Warren, Ohio
SPECIALIZED PRODUCERS OF COLD ROLLED STRIP STEEL

"Nationally, the outstanding issue in a session that will include controversy over amendment of the Wagner Labor Relations Act and other vital labor relations issues, will be that of governmental expenditure and taxation. I say that with due regard to the interest of all employers in the attempts that will be made to extend the drastic feature of the labor relations law or to make its provisions more equitable.

"We have become accustomed to the figure of a billion dollars, and have now for so long an accumulation of deficits and added debt, that we have become all too hardened to this issue. The cold truth is that we have not yet really felt the effect of this unexampled era of spending beyond our means. At the moment, we are still able to borrow, and the prophets who point out the dangers of our present path go unheeded. It is not enough, apparently, to say that out of a national income of something under 70 billions in 1937, we spent almost one-fourth for purposes of government. It is not enough to point out the rise in the national debt until it is right at 40 billion dollars, substantially greater than ever before in our history. There are some figures, however, that are more dramatic. Do you realize that in our industrial centers almost one-fourth the population is receiving public assistance? Do you know that in these cities, almost without exception, as much money is being spent for welfare and for relief as for all other purposes of local government? These figures may come as news. There is one, however, that will not. May I simply ask each one of my hearers to make a mental note of the amount of taxes he has paid and will pay for 1938, as compared with five years ago, 10 years ago? And when you get that figure firmly in your mind, add this footnote: Your government spent enough money, which it did not get by taxation last year, to have added another fifth or one-fourth to the taxes which it should have collected. You didn't pay that extra one-fifth last year, but you will pay, with interest. And you may be sure that government so arranges its revenue program that its tax burden falls more heavily in proportion as your business or your income becomes larger."

Resurrect the Incentives

William H. Colvin, Jr., president, Rotary Electric Steel Co., Detroit, also discussed the general business and political situation and concluded with the following recommendations in

bringing about a more sound situation:

"Resurrect the incentives which make men and capital go to work. Seek for sound levels of values at which lender and borrower can safely do business together. Encourage reserves for obsolescence and bad times, be respectful of thrift. And finally, cut out the paternalism which, however praiseworthy and desired, cannot be afforded by a nation or a people already living on its capital. The need for an abundance of wealth exists, the business is there, capital is there, and the will to improve is inherent in mankind. In short, let us give up wishing, get down to earth, and go to work for our customers. Such thoughts, if they spread, will soon get the politician out of his dream too, or out of office; producers everywhere will again produce, the customer, recognizing value, will make new records in consumption, the common wealth will begin again to increase, and the gaining health of the country be reflected in healthy industry, the steel industry, and yours."

Steel Founders' Society To Give Lorenz Medal

CLEVELAND—Directors of the Steel Founders' Society of America, meeting here Jan. 11, established a Frederick A. Lorenz Memorial medal, in honor of the late president of the society, which will be awarded each year to the individual adjudged to have contributed the most meritorious service to the Industry during the year. The first such award will be made at the society's annual meeting in Edgewater Beach Hotel, Chicago, Feb. 8 and 9.

Detroit Welding Society Hears J. G. Magrath

THE Detroit section of the American Welding Society was to hear J. G. Magrath, specialist of the applied engineering department, Air Reduction Sales Co., New York, speak on "Flame Descaling" at its January meeting Thursday night, Jan. 19, at the Detroit Leland Hotel.

Machine Tool Exports Up Third in October

EXPORTS of power driven metalworking machinery for October, 1938, showed a gain of 33 per cent over the October, 1937, dollar volume, according to the Department of Commerce. Exports for all classes of industrial machinery declined 10 per cent for the comparable months. For the first 10 months of 1938, $79,318,856 worth of machine tools were shipped, as compared with $46,175,029 for the 1937 period, representing a gain of 72 per cent. Exports of all classes of industrial machinery, including machine tools, gained only 15 per cent. Machine tools made up 35 per cent of the total volume of $225,981,992 shipped in the first 10 months of 1938.

Lewis Welding Organized; J. T. Lewis President

CLEVELAND—Lewis Welding & Engineering Corp. has been organized to fabricate a wide range of welded steel products and act as a consulting engineering organization. James T. Lewis, Jr., Chagrin Falls, is president and treasurer.

Allen-Bradley Co., Milwaukee, manufacturer of electric motor control, has opened a sales office at 101 Broadway, Rockford, Ill. H. L. O'Donnell, formerly of the Chicago office, has been placed in charge.

Time Marches on in METAL CLEANING, too

WHEELABRATOR *CENTRIFUGAL* BLASTING IS AIRLESS—REDUCES POWER NEEDS—IMPROVES THE FINISH—SAVES SPACE—CUTS COSTS

Wheelabrator *airless* abrasive blasting is the modern metal cleaning method used by more than 600 foundries, forge shops, heat-treating shops, steel mills, and similar industries. General Motors has 35 units; Ford has 29; International Harvester has 21 and sixty-three other concerns have from 2 to 13 machines each!

Each of these machines was installed on the basis of proved performance in reducing cost, improving the finish, and speeding up production. It is not unusual to save up to 50% by Wheelabrating and in most cases the investment is returned in from 6 to 18 months.

Let us prove these statements on your own work by actual test. For complete information on Wheelabrating write for Catalog No. 212.

THE American FOUNDRY EQUIPMENT CO. 510 S. BYRKIT ST. MISHAWAKA, IND.

Plan Proposed for Gathering of Statistics by Government

WASHINGTON—The Central Statistical Board, which was created by Executive order in 1933 to promote economy and efficiency and eliminate unnecessary duplication in the gathering of Government statistics, has recommended to the White House a plan for doing by legislative action what it was unable to do in the face of mushrooming of New Deal agencies and a growing lust for more facts and figures from industry.

President Roosevelt last May requested the board to make recommendations for remedying the situation after it was reported that business groups had expressed growing concern in letters reaching Washington that they were being overburdened with questionnaires and requests for statistics.

Under the recommendations, the Temporary National Economic Committee, for example, would have been required to consult the board before sending out its steel industry questionnaire to determine if it was seeking information already on file in another Government agency.

Tax Return Consolidation

After suggesting that its own powers be made "adequate," the board also recommended that (1) further consideration be given a possible consolidation of tax returns; (2) confidential information be made available to other agencies of the Government under rules affording "proper protection"; (3) in cases where the board is unsuccessful in eliminating duplication, it would hold hearings and report to the President, who would be empowered to correct the duplication; (4) when the requirements of two agencies can be served by the collection of figures by a single agency, the board, with the approval of the President, could so order; and (5) all Government bureaus collecting statistics would be required to keep uniform records of all questionnaires and report regularly to the board, or other central statistical agency.

Speed Case X-1515 Available in Plates

PLATES and various shapes of Speed Case X-1515 are now being offered to the trade by W. J. Holliday & Co., Indianapolis. The plate is said to machine 50 to 100 per cent faster than standard SAE plate and at the same time produce a smooth, bright finish with no tendency toward tearing. When case hardened the Speed Case plates show practically no warpage and have a surface hardness of 62-66 Rockwell "C" combined with a shock-resistant core structure. These plates have found considerable use in the rubber and bakelite industries as a die material.

McKAY DRAWBENCHES

Drawbenches for steel and non-ferrous tubes and bars, with conventional electric drive or automatic AC or DC drive for slow starting and acceleration to the drawing speed.

Push button control initiates the completely automatic drawing cycle, automatic arms facilitating removal of the tube or bars.

The automatic draw grip permits quicker interchange of the draw bits for size and for multiple draw.

PATENT APPLIED FOR

Faster grip return with automatic deceleration and air cushioned stop with positive positioning for gripping the tube or bar points, increases production and diminishes point scrap.

We solicit your inquiries for tube and bar drawbenches. We also build complete tube forming, sizing, welding and cut-off equipment.

Wallace W. Kerr, who has devoted the last 20 years to the development of drawbench machinery is now associated with McKay in the engineering and sales of their new line of drawbench machinery and equipment.

McKAY

THE McKAY MACHINE COMPANY

ENGINEERS AND MANUFACTURERS OF SHEET, TIN AND STRIP MILL EQUIPMENT

YOUNGSTOWN, OHIO

Week's Building Awards Highest Since May, 1930

ENGINEERING construction awards placed in the week ended Jan. 14 totaled $119,726,000, the highest since the week ended May 15, 1930, according to *Engineering News-Record*. In the preceding week awards were $86,995,000 and in the corresponding week of 1938 were $42,590,000.

The heavy volume of lettings was due entirely to public activity. The week's total of this type of work, $109,745,000, was the highest on record. Private work continues to lag, the week's total in this classification being $9,981,000, as compared with $11,077,000 in the previous week and $15,791,000 in the like week of 1938.

Foundrymen Hear Talk On Core Room Control

"LATEST Developments in Core Room Control" was to be the topic of a talk by L. P. Robinson of Cleveland before the Detroit chapter of the American Foundrymen's Association, Thursday, Jan. 19. The chapter was to meet in the Fort Shelby Hotel.

On the Assembly Line

(CONTINUED FROM PAGE 48)

where the UAW executive body has been in session with guards posted at their office doors.

Those who could not get into the hallways and offices on the floor rented by the UAW filled the stairways from the ground floor up. The ones who reached the top took the hinges off the door of the conference room where the executive board was meeting.

Another mob, possibly bigger than the first, representing the huge West Side local, accomplished a coup, took over the elevators and forced their way into the throng of Martin men on the 11th floor.

The pro-Martin group would not leave the building until the anti-Martin group agreed to leave first. The mob held the building for more than five hours, but did not depart until the executive board agreed to meet with three committees when the board resumed sessions Saturday.

The executive board session is part of a long-drawn out battle between Martin and his alleged communistic opponents who are now definitely seeking to oust him as union president.

Foundry Equipment Meeting On Feb. 14

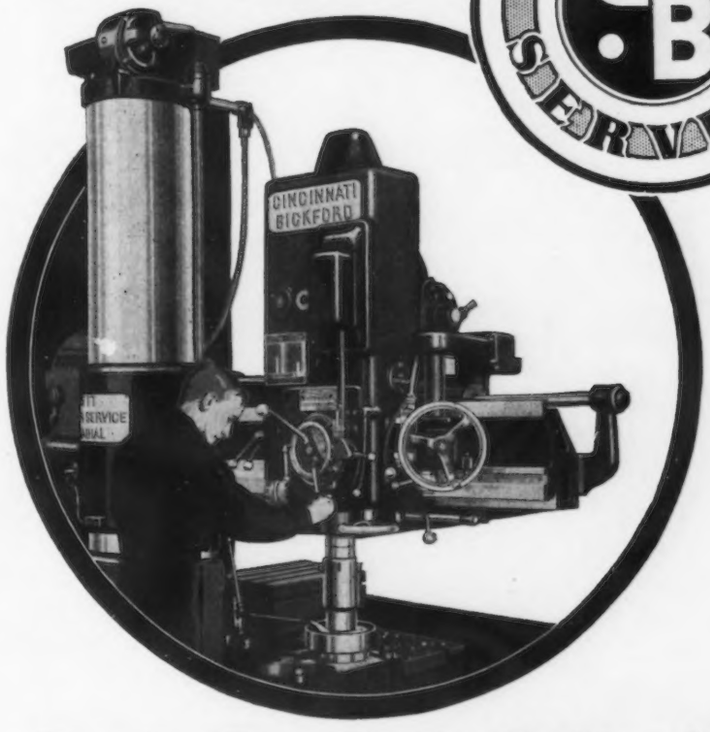
CLEVELAND—The annual meeting of the Foundry Equipment Manufacturers Association will take place in the Terminal Club, Cleveland, Tuesday, Feb. 14, according to A. J. Tuscany, executive secretary. Consideration will be given to the industry's position under the Fair Labor Standards Act or Wage-Hour Bill, and also to the status of patents in relation to the new conditions brought about by the National Economic Committee's investigation.

Sheet & Tube Obtains License From Inland

CHICAGO—The Inland Steel Co. has licensed Youngstown Sheet & Tube Co. to produce lead-bearing steel under Inland's Ledloy patents.

36 SPEEDS-18 FEEDS

SUPER SERVICE CB



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36 speeds and 18 feeds—all in geometric progression and so closely graded that each tool can be operated at the dollar-saving limit of its endurance. There is no duplication or overlapping in the Super-Service speed and feed ranges.

For drilling, boring, tapping, facing and reaming—holes of many sizes and in materials from tough alloy steels to cast iron and aluminum—Super-Service Radials merit your consideration on the basis that, at all times, they produce "More Holes Per Dollar." Detailed specifications are contained in Bulletin R-24. Write for your copy . . . Today!

THE CINCINNATI BICKFORD TOOL CO.
OAKLEY CINCINNATI OHIO U.S.A.

FABRICATED STEEL

. . . Lettings advance to 22,400 tons from 19,600 tons last week . . . New projects slightly lower at 13,550 tons

NORTH ATLANTIC STATES

AWARDS

1700 Tons, Newington, Conn., Veterans' Home, to Ingalls Iron Works Co., Birmingham.

1500 Tons, Middletown, Conn., hospital buildings, to Standard Structural Steel Co., Hartford, Conn.

900 Tons, Bloomfield, N. J., Junior High School, to J. G. Schaefer Iron Works, Edgewater, N. J.

460 Tons, Carmel, N. Y., Delaware Aqueduct, cont. No. 321, to American Bridge Co., Pittsburgh.

410 Tons, Butler County, Pa., State highway bridge, to American Bridge Co., Pittsburgh; through York Engineering & Contracting Co. general contractor.

400 Tons, Cambridge, Mass., Lever Bros. No. 2 plant, to New England Structural Co., Everett, Mass.; through Stone & Webster, contractors.

372 Tons, Middletown, Conn., two hospital buildings, to Berlin Construction Co., Springfield, Mass.; through Tremaligino Brothers.

325 Tons, Clifton, N. J., highway bridges, to American Bridge Co., Pittsburgh.

300 Tons, Philadelphia, warehouse, to Bethlehem Steel Co., Bethlehem, Pa.

240 Tons, Lawrence, Mass., three bridges, to American Bridge Co., Pittsburgh; O'Malley & Delaney, Waltham, Mass., contractors.

205 Tons, York, Pa., Senior High School, to A. B. Rote & Co., Lancaster, Pa.; through I. Reindollar & Son.

200 Tons, Annapolis, Md., alterations to chapel building, to Bethlehem Steel Co., Bethlehem, Pa.

195 Tons, Mahanoy City, Pa., high school, to American Bridge Co., Pittsburgh.

180 Tons, Cambridge, Mass., Webster School, to New England Structural Co., Everett, Mass.; M. Spinelli & Sons, Boston, contractors.

140 Tons, Baltimore, Home Economics Building, University of Maryland, to Dietrich Brothers, Baltimore.

140 Tons, Pittsburgh, Liberty Tubes grade separation, to Bethlehem Steel Co., Bethlehem, Pa.

120 Tons, Pittsburgh, Spring Garden Elementary School, to Pittsburgh Bridge & Iron Works, Pittsburgh.

110 Tons, Lackawanna County, Pa., bridge, to American Bridge Co., Pittsburgh.

100 Tons, Ashland, Del., highway bridge, to American Bridge Co., Pittsburgh.

THE SOUTH

2850 Tons, Richmond, Va., hospital building, Medical College of Virginia, to American Bridge Co.

1620 Tons, Frankfort, Ky., State office building, to International Steel Co., Evansville, Ind.; through Skilton Construction Co.

905 Tons, Live Oak County, Tex., bridge; 770 tons, to Mosher Steel Co., Dallas, Tex.; 135 tons to Virginia Bridge Co., Roanoke, Va.; through Cage Bros. and L. A. Turner.

265 Tons, Panola County, Tex., bridge, to Pittsburgh-Des Moines Steel Co., Pittsburgh; through W. R. West.

235 Tons, Alexandria, Va., telephone building, to Lehigh Structural Steel Co., Allentown, Pa.

235 Tons, Baton Rouge, La., stock barn, to Jones & Laughlin Steel Corp., Pittsburgh.

155 Tons, Jackson County, N. C., highway bridge, to Southern Engineering Co., Charlotte, N. C.

150 Tons, Greenville, Tex., Kress store, to Mosher Steel Co., Dallas, Tex.

105 Tons, Amite Count, Miss., highway span, to Stupp Brothers Bridge & Iron Co., St. Louis.

CENTRAL STATES

1200 Tons, Saginaw, Mich., Arthur Hill High School, to Bethlehem Steel Co., Bethlehem, Pa.

800 Tons, Kansas City, Kan., State viaduct, Minnesota Avenue, to Kansas City Structural Steel Co., Kansas City.

600 Tons, Toledo, Ohio, and Marcus Hook, Pa., supports for cracking and combustion cases for Sun Oil Co., to Bethlehem Steel Co., Bethlehem, Pa.

430 Tons, Richfield, Kan., bridge, to Missouri Valley Bridge & Iron Co., Leavenworth, Kan.

370 Tons, Youngstown, Ohio, crane runway for Republic Steel Corp., to Truscon Steel Co., Youngstown.

260 Tons, Pike County, Ohio, State bridge, to Bethlehem Steel Co., Bethlehem, Pa.; through Purdy Construction Co., Mansfield, O.

225 Tons, Sandusky, Ohio, car dumping trestle for Pennsylvania Railroad, to American Bridge Co., Pittsburgh.

220 Tons, Lansing, Mich., Fair building for Michigan State College, to Jarvis Engineering Co., Lansing, Mich.; through Christman Lansing Co.

190 Tons, Sedgewick County, Kan., bridge, to George C. Christopher & Son, Wichita, Kan.; through Rhodes Construction Co.

126 Tons, Wyanet, Ill., Burlington Railroad bridges, to Vierling Steel Works, Chicago.

125 Tons, Jackson County, Ind., bridge, to American Bridge Co., Pittsburgh.

120 Tons, Cleveland, Baltimore & Ohio warehouse, to Republic Structural Iron Works, Cleveland; through Minton Construction Co.

115 Tons, Youngstown, Ohio, McCartney Road bridge, to American Bridge Co., Pittsburgh.

110 Tons, Lancaster, Ohio, East School, to an unnamed bidder.

In last week's issue in this column, 459 tons at Madison, Wis., 157 tons, Terre Haute, Ind., and 103 tons, Waukesha, Wis., were reported as structural contracts awarded to Joseph T. Ryerson & Son, Inc. These jobs were intended for the reinforcing bar column and will be found there in this issue.

WESTERN STATES

1367 Tons, Seattle, Wash., Lake Washington Bridge, unit 4, to Pacific Car & Foundry Co., Seattle; through Puget Sound Bridge & Dredging Co., Seattle; J. H. Pomeroy & Co., Inc., San Francisco; and Parker-Schram Co., Portland, Ore., joint contractors.

460 Tons, Seattle, Wash., Pier 40, to Columbia Steel Co., Seattle.

400 Tons, Billings, Mont., senior high school, to Bethlehem Steel Co., Bethlehem, Pa.

245 Tons, Mesa County, Colo., bridge, to Midwest Steel & Iron Works Co., Denver; through Knutson Construction Co.

180 Tons, Douglas County, Colo., highway bridge, to Midwest Steel & Iron Works Co., Denver.

130 Tons, Bent County, Colo., bridge, to Minneapolis-Moline Power Implement Co., Minneapolis, Minn.

110 Tons, Calexico, Cal., Specification 144D, to Pacific Iron & Steel Co., Los Angeles, and Commercial Iron Works, Los Angeles.

100 Tons, Wolf Point, Mont., underpass, to American Bridge Co., Pittsburgh; through Nolan Brothers, Inc., Minneapolis, contractor.

Unstated Tonnage, Sacramento, Cal., crane at air depot, to Harnischfeger Corp., San Francisco.

PENDING STRUCTURAL PROJECTS

NORTH ATLANTIC STATES

1500 Tons, Queens, N. Y., Triboro Hospital; bids to Department of Public Works, New York.

1000 Tons, Southbury, Conn., training school and home for feeble minded.

1000 Tons, Wawarsing, N. Y., shafts for Delaware Aqueduct.

700 Tons, Richmond, N. Y., high school addition.

500 Tons, Cambridge, Mass., high and Latin school addition and alterations.

400 Tons, Greenhaven, N. Y., power plant.

350 Tons, Middletown, Conn., school and auditorium.

250 Tons, Storrs, Conn., college dormitories.

235 Tons, New York, Tremont Health Center.

200 Tons, Norwich, Conn., male staff house.

200 Tons, Utica, N. Y., shop building No. 44.

165 Tons, Southbury, Conn., groups D and E, State buildings.

150 Tons, Bethesda, Md., National Institute of Health.

120 Tons, Chambersburg, Pa., dairy alterations, Supplee-Wills-Jones Milk Co.

110 Tons, Queens, N. Y., Cross Island Parkway project; bids Jan. 20.

SOUTH AND SOUTHWEST

373 Tons, Winslow, Ariz., bridge; bids Jan. 27.

350 Tons, Richmond, Ky., Student Union Building, Eastern State Teachers College.

345 Tons, Huttonsville, W. Va., penitentiary.

200 Tons, Clay County, W. Va., Ivydale bridge.

175 Tons, Quantico, Va., dispensary and barracks, Navy Department.

CENTRAL STATES

2000 Tons, Indianapolis, Ind., Coliseum at State Fair grounds; bids received Jan. 18.

600 Tons, Macomb County, Mich., factory and office building, Divco-Twin Truck Co.

500 Tons, Milwaukee, bascule bridge over Milwaukee river, bids Jan. 31.

275 Tons, Chicago, Division Street station, contract D-5.

200 Tons, Canton, Ohio, warehouse, United Wholesale Grocery.

200 Tons, Ralston, Neb., viaduct.

175 Tons, Inner Grove, Minn., repairs, railroad bridge No. 3450.

160 Tons, Mount Clemens, Mich., State beam spans.

135 Tons, Owosso, Mich., State beam spans.

115 Tons, West Bend, Wis., grade school.

WESTERN STATES

600 Tons, Albany, Ore., overcrossing; bids Jan. 26.

275 Tons, Oakland, Cal., hangar; project abandoned.

250 Tons, Coram, Cal., tunnel cover section; bids Jan. 27.

115 Tons, Mare Island, Cal., storehouse, Navy Department.

Unstated Tonnage, Grand Coulee Dam, Wash., stop log guides; bids Jan. 30.

FABRICATED PLATES

AWARDS

2963 Tons, Westchester County, N. Y., Delaware Aqueduct, contract No. 323, to Commercial Shearing & Stamping Co., Youngstown, through Seaboard Construction Co., New York.

903 Tons, Detroit, pipe line, to Alco Products Co., Dunkirk, N. Y.

180 Tons, Trenton, N. J., six tanks, to Youngstown Boiler & Tank Co., Youngstown, Ohio.

100 Tons, Richmond, Cal., water tank, to Boiler Tank & Pipe Co., Oakland, Cal.

PENDING PROJECTS

2000 Tons, Corbett, Wyo., Buck Springs Creek siphon; Consolidated Steel Corp., Los Angeles, low bidder.

2000 Tons, Corbett, Wyo., Shoshone River siphon; Consolidated Steel Corp., Los Angeles, low bidder.

Unstated Tonnage, Tucson, Ariz., water tank; bids Jan. 20.

SHEET PILING

AWARDS

1166 Tons, Stratford, Conn., Housatonic River bridge, to Carnegie-Illinois Steel Corp., Pittsburgh.

152 Tons, Morgan County, Ohio, piling for State, to Ben Tom Supply Co., Columbus.

PENDING PROJECTS

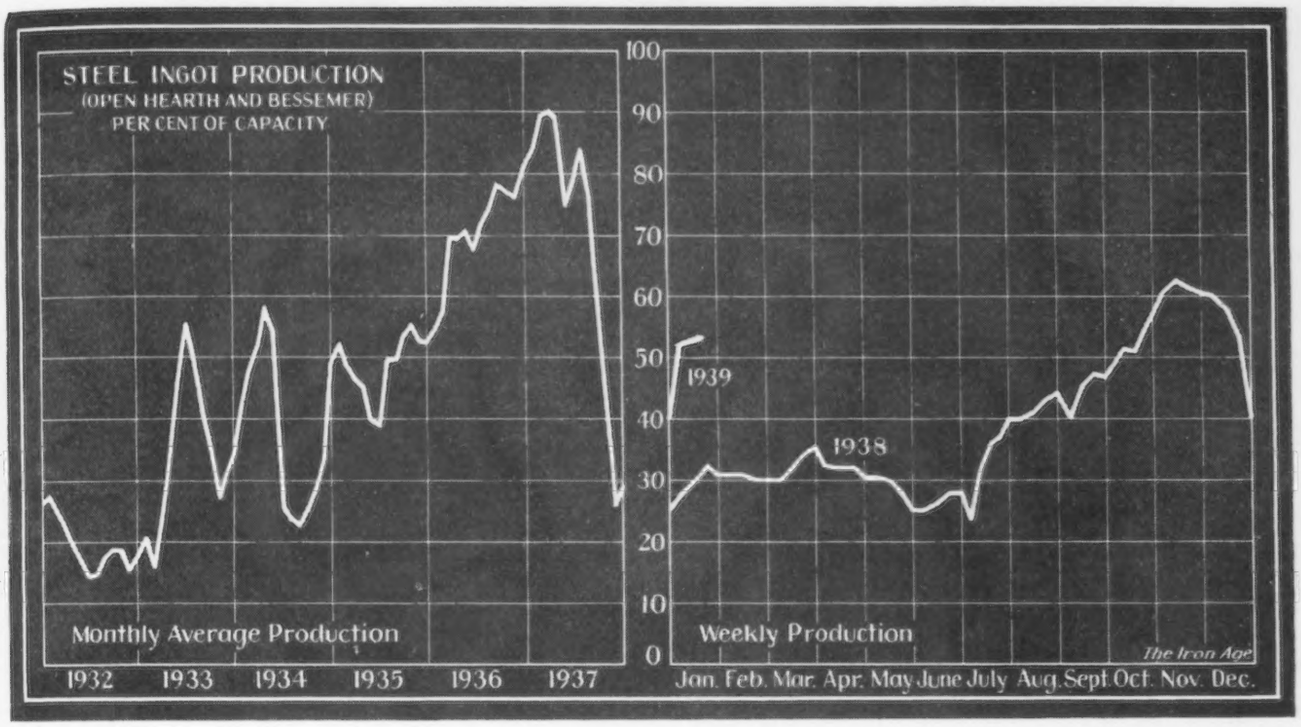
1800 Tons, New York, bulkhead.

1500 Tons, Providence, R. I., U. S. Engineers.

900 Tons, Milwaukee, Cherry Street bridge.

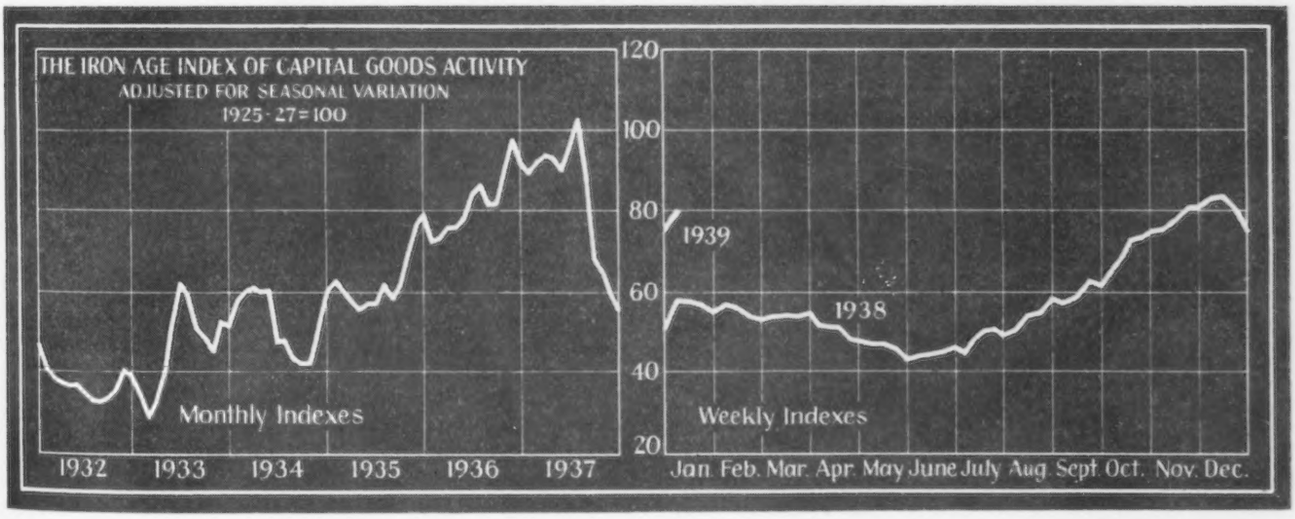
500 Tons, Cleveland, piling for cut No. 5A, Collision Bend, Cuyahoga River; bids Jan. 23.

Ingot Production Rises ½ Point to 53 Per Cent



District Ingot Production, Per Cent of Capacity	Pitts-burgh	Chicago	Valleys	Phila-delphia	Cleve-land	Wheel-ing	Buffalo	Detroit	Southern	S. Ohio River	Western	St. Louis	East-ern	Aggre-gate
CURRENT WEEK..	44.0	49.0	53.0	35.0	48.0	83.0	45.0	87.5	60.5	62.0	40.0	45.0	75.0	**53.0**
PREVIOUS WEEK..	44.0	49.0	52.0	35.0	46.0	80.0	45.0	84.0	60.5	63.5	40.0	47.5	75.0	**52.5**

Index Rises to 80.4; Building Awards at Nine-Year Peak



THE IRON AGE index of capital goods activity continues to show strength and is slowly recovering the ground lost during the holidays. For the week ended Jan. 14 the index was 80.4, a gain of 4.8 points over the preceding week and 22.9 points above the corresponding week of 1938. The index's improvement was due primarily to the sharp gain recorded by the construction series as building awards rose to the highest weekly volume since the week of May 15, 1930. Failure to show gains in keeping with the seasonal trend was responsible for the losses sustained by the automobile and the steel series.

	Week Ended Jan. 14	Week Ended Jan. 7	Comparable Week 1938	Comparable Week 1929
Steel ingot production[1]	92.0	98.0	43.6	118.3
Automobile production[2]	79.3	85.2	71.0	149.3
Construction contracts[3]	104.2	94.6	66.1	112.0
Forest products carloadings[4]	55.1	50.2	52.0	133.9
Production and shipments, Pittsburgh District[5]	71.4	66.3	55.0	120.2
Combined index	**80.4**	**75.6**	**57.5**	**126.7**

Sources: 1. THE IRON AGE; 2. Ward's Automotive Reports; 3. *Engineering News-Record*; 4. Association of American Railroads; 5. University of Pittsburgh.

. . . SUMMARY OF THE WEEK . . .

. . . Railroad inquiries promise some nearby buying.

° ° °

. . . Union Pacific allocates 100,000 tons of rails and fittings.

° ° °

. . . Steel scrap composite up; operations rise slightly.

RAILROAD orders and inquiries are furnishing the iron and steel market with much of its current interest. Even without government assistance, it is now estimated by the steel trade that orders for rails this year will total about 1,000,000 tons, or double the amount rolled in 1938, and that iron and steel sales as a whole to the railroads will gain not less than 50 per cent over those of last year.

The Union Pacific has allocated upward of 100,000 tons of rails and accessories, though formal orders have not been placed; it is also inquiring for 1000 to 2000 box cars and a small lot of passenger equipment. The St. Louis-San Francisco has ordered 12,500 tons of rails from the Alabama mill. The Southern Pacific may buy 40 locomotives and its rail order probably will total 25,000 tons. The Pittsburgh & West Virginia may soon order 400 freight cars, on which revised inquiries have been issued, and plans also to rebuild 320 hopper cars in its own shops.

The Rock Island has authorized the expenditure of $32,412,000, of which part will be spent for about 45,000 tons of rails, other improvements to include rebuilding of freight and passenger cars and some bridge construction. The Missouri Pacific and subsidiaries have received court authorization to spend $8,560,864, which will cover about 40,000 tons of rails and accessories, freight car repairs, new locomotives and other equipment, with a possibility that more than 1000 freight cars will be built if the trustees' recommendations are carried out.

OTHER than railroad prospects, many of which will not materialize in mill rollings for some weeks at least, steel demand is not gathering much fresh momentum. Steel sales in the aggregate and production have edged upward slightly, but the new year has not yet brought the stronger demand that many in the trade had confidently expected. However, the general trend of new projects is pointing to a more marked improvement at some future date, possibly in February.

The automobile industry is buying from hand-to-mouth, carefully watching its production schedules so that assemblies will not outrun retail sales. Its steel purchases are being made regularly, but in relatively small tonnages. Large purchases are not expected before early February, when the spring outlook for car sales will be clearer. Meanwhile car production has gained in the past week to a satisfactory level for January.

Building construction continues to take a fairly good volume of steel. This week's awards of fabricated structural steel total about 22,500 tons, with new projects amounting to 13,500 tons, while lettings of reinforcing bars were nearly 20,000 tons. The Lock Joint Pipe Co., Ampere, N. J., has received a contract for 15 miles of concrete aqueduct for the Boston Metropolitan District Water Supply Commission, calling for about 30,000 tons of steel, including 15,000 tons of rods and 5000 tons of plates.

MISCELLANEOUS manufacturing industries are showing signs of a pickup after curtailments for annual inventory taking. The farm implement trade is accounting for a good share of current steel and pig iron orders at Chicago, stove plants in the Belleville section of Illinois having resumed operations after a shutdown of several weeks, and higher foundry operations in several areas have brought increased pig iron shipments this month. At Cleveland, for example, they will probably exceed those of the best month last year.

Steel ingot production for the week is estimated at 53 per cent of the industry's capacity, a slight rise over last week. Individual companies are experiencing contrary trends, depending on the products they make. An independent company which has lost eight points in its rate in the past two weeks attributes the loss almost entirely to lower sheet and strip mill operations. Some companies have completed shipments against the low-priced sheet and strip commitments of last October and the new tonnage is not coming in rapidly enough to replace them. Tin plate orders are improving but at a slow rate.

In this situation steel prices are holding surprisingly well. Excepting reinforcing bars, which have long been weak, and some inherited irregularities from last year, prices are fairly firm.

Steel scrap prices are virtually without change except at Chicago, where the minimum of $13.50 has disappeared, leaving a flat quotation of $14. This raises THE IRON AGE scrap composite price to $15, its peak of 1938.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	Jan. 17, 1939	Jan. 10, 1939	Dec. 20, 1938	Jan. 18, *1938
Rails, heavy, at mill	$40.00	$40.00	$40.00	$42.50
Light rails: Pittsburgh, Chicago, Birmingham	40.00	40.00	40.00	43.00
Rerolling billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point.	34.00	34.00	34.00	37.00
Sheet bars: Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point	34.00	34.00	34.00	37.00
Slabs: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point	34.00	34.00	34.00	37.00
Forging billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham	40.00	40.00	40.00	43.00
Wire rods: Nos. 4 and 5, Pittsburgh, Chicago, Cleveland	43.00	43.00	43.00	47.00
Skelp, grvd. steel: Pittsburgh, Chicago, Youngstown, Coatesville, Sparrows Point, cents per lb.	1.90	1.90	1.90	2.10

Finished Steel

Cents per Lb.:				
Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham	2.25	2.25	2.25	2.45
Plates: Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont	2.10	2.10	2.10	2.25
Structural shapes: Pittsburgh, Chicago, Gary, Buffalo, Bethlehem, Birmingham	2.10	2.10	2.10	2.25
Cold finished bars: Pittsburgh, Buffalo, Cleveland, Chicago, Gary	2.70	2.70	2.70	2.90
Alloy bars: Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton	2.80	2.80	2.80	3.00
Hot rolled strip: Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown, Birmingham	2.15	2.15	2.15	2.40
Cold rolled strip: Pittsburgh, Cleveland, Youngstown	2.95	2.95	2.95	3.20
Sheets, galv., No. 24: Pittsburgh, Gary, Sparrows Point, Buffalo, Middletown, Youngstown, Birmingham.	3.50	3.50	3.50	3.80
Hot rolled sheets: Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown	2.15	2.15	2.15	...
Cold rolled sheets: Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown	3.20	3.20	3.20	...

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

Cents Per Lb.:	Jan. 17, 1939	Jan. 10, 1939	Dec. 20, 1938	Jan. 18, *1938
Wire nails: Pittsburgh, Chicago, Cleveland, Birmingham	2.45	2.45	2.45	2.75
Plain wire: Pittsburgh, Chicago, Cleveland, Birmingham	2.60	2.60	2.60	2.90
Barbed wire, galv.: Pittsburgh, Chicago, Cleveland, Birmingham	3.20	3.20	3.20	3.40
Tin plate, 100 lb. base box: Pittsburgh and Gary	$5.00	$5.00	$5.00	†$5.35

*Pittsburgh prices only.
†Subject to post-season adjustment.

Pig Iron

Per Gross Ton:				
No. 2 fdy., Philadelphia	$22.84	$22.84	$22.84	$25.84
No. 2, Valley furnace	21.00	21.00	21.00	24.00
No. 2, Southern Cin'ti	21.06	21.06	21.06	23.89
No. 2, Birmingham	17.38	17.38	17.38	20.38
No. 2, foundry, Chicago†	21.00	21.00	21.00	24.00
Basic, del'd eastern Pa.	22.34	22.34	22.34	25.34
Basic, Valley furnace	20.50	20.50	20.50	23.50
Malleable, Chicago†	21.00	21.00	21.00	24.00
Malleable, Valley	21.00	21.00	21.00	24.00
L. S. charcoal, Chicago	28.34	28.34	28.34	30.24
Ferromanganese, seab'd carlots	*80.00*	92.50	92.50	102.50

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	$15.75	$15.75	$15.75	$14.25
Heavy melting steel, Phila.	15.25	15.25	15.25	14.75
Heavy melting steel, Ch'go.	**14.00**	13.75	13.75	13.00
Carwheels, Chicago	12.50	12.50	12.50	15.50
Carwheels, Philadelphia	16.75	16.75	16.75	16.25
No. 1 cast, Pittsburgh	15.50	15.50	15.50	16.25
No. 1 cast, Philadelphia	16.75	16.75	16.75	16.75
No. 1 cast, Ch'go (net ton)	12.50	12.50	12.50	12.50

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$3.75	$3.75	$3.75	$4.00
Foundry coke, prompt	4.75	4.75	4.75	5.00

Non-Ferrous Metals

Cents per Lb. to Large Buyers:				
Copper, electrolytic, Conn.	11.25	11.25	11.25	10.875
Copper, lake, New York	11.375	11.375	11.375	11.125
Tin (Straits), New York	46.50	46.75	46.00	41.75
Zinc, East St. Louis	4.50	4.50	4.50	5.00
Zinc, New York	4.89	4.89	4.89	5.35
Lead, St. Louis	4.70	4.70	4.70	4.75
Lead, New York	4.85	4.85	4.85	4.90
Antimony (Asiatic), N. Y.	14.00	14.00	14.00	15.625

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
January 17, 1939	2.286 a Lb.	$20.61 a Gross Ton	$15.00 a Gross Ton
One week ago	2.286	20.61	14.92
One month ago	2.286	20.61	14.92
One year ago	2.512c.	23.25	14.00

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.

Based on average basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel HIGH	Finished Steel LOW	Pig Iron HIGH	Pig Iron LOW	Steel Scrap HIGH	Steel Scrap LOW
1938	2.512c., May 17	2.211c., Oct. 18	$23.25, June 21	$19.61, July 6	$15.00, Nov. 22	$11.00, June 7
1937	2.512c., Mar. 9	2.249c., Jan. 4	23.25, Mar. 9	20.25, Feb. 16	21.92, Mar. 30	12.92, Nov. 16
1936	2.249c., Dec. 28	2.016c., Mar. 10	19.73, Nov. 24	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9
1935	2.062c., Oct. 1	2.056c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, Apr. 23
1934	2.118c., Apr. 24	1.945c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	1.953c., Oct. 3	1.792c., May 2	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.915c., Sept. 6	1.870c., Mar. 15	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	1.981c., Jan. 13	1.883c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.192c., Jan. 7	1.962c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.223c., Apr. 2	2.192c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.192c., Dec. 11	2.142c., July 10	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 17	13.08, Nov. 22

. . THIS WEEK'S MARKET NEWS . .

STEEL OPERATIONS

. . . Rate for country up slightly to 53% but some mills lose ground.

ALTHOUGH steel ingot production for the industry as a whole is estimated by THE IRON AGE for this week at 53 per cent of the industry's capacity, some mills have lost ground. Some of the losses may be accounted for by the completion of commitments for sheets and strip that were booked last October at low prices. The automobile industry is taking shipments regularly but on a restricted basis.

Notwithstanding the conservatism of the automobile industry, DETROIT is still the bright spot of the country in steel operations, its average rate being 87½ per cent, a gain of three and a half points. Ford Motor Co. has put on an additional open hearth, making nine active, while Great Lakes Steel has 14 of its 16 furnaces in service.

Ingot output continues to gain slowly at YOUNGSTOWN, CLEVELAND and in the WHEELING-WEIRTON district. The rise at YOUNGSTOWN is only one point, to 53 per cent, with CLEVELAND-LORAIN up two points to 48 per cent and WHEELING-WEIRTON up three points to 83 per cent.

PITTSBURGH operations are unchanged at 44 per cent and CHICAGO holds at 49 per cent. Operations dipped a little in SOUTHERN OHIO, but in other districts not mentioned above there is little or no change.

PIG IRON

. . . Ferromanganese prices reduced $12.50 . . . Pig iron shipments gain

FERROMANGANESE prices have been reduced $12.50 a ton, making the new quotation $80 on 78 to 82 per cent lump. Ferromanganese briquettes have been reduced ¼c. a lb. The reduction in ferromanganese prices was apparently made in an effort to combat foreign competition, which has resulted in prices as low as $75 on imported material. Spiegeleisen prices have not been changed, and a leading producer says they will not be.

Although sales of iron are small in all markets, there has been an improvement in shipments against contracts, many of which were not completed at the end of 1938. At CLEVELAND it is stated that January shipments may exceed those of any month last year. Deliveries during the first half of the month were 15 per cent over the December average and slightly ahead of those in November. Nearly all shipments are for current melt and many of them are to automotive foundries.

ST. LOUIS also reports fairly good shipments, with a prospect that this month's total will be larger than that of December, which was the highest in 1938. Stove foundries in the Belleville district, which have been down for inventory in the past few weeks, are expected to resume operations on nearly full schedules this week.

Pig iron shipments are increasing at CHICAGO, but what is still more indicative of a gain in the melt is a 20 per cent rise in coke shipments over last month.

In other districts there has not been much change, but there are indications that foundry melt is increasing in a number of areas even though pig iron business has not benefited. As many foundrymen have enough iron either in storage or on contract to carry them through the first quarter, not much buying is expected until March.

NEW BUSINESS

. . . Sales gaining but at disappointingly slow rate

BOOKINGS so far this month at PITTSBURGH are running slightly ahead of the comparable period in December. New business during the past week was in greater volume than the week before, mainly because it was the first full week not influenced by seasonal factors. Producers continue to be disappointed by the current volume of orders and especially the lack of support from the automotive industry. There are still indications, however, that demand from miscellaneous steel users, can makers and, to some extent, railroads, will materialize during the latter part of the first quarter, in addition to structural business resulting from recent PWA projects. There does not appear to be room however for an expectation of a sharp uptrend during the next few weeks.

Although the feeling in CHICAGO steel circles still is good, a slight easing in the rate of new business is apparent. Light flat rolled is less active, whereas the demand for bars, plates, and wire seems to be holding up fairly well. One mill attributes a recent loss of some eight points in its operating rate largely to decreased sheet and strip specifications. Buying by motor car plants is steady, but not in large tonnages. Purchasing agents have not yet overcome their reluctance to buy far ahead, and indeed, there is no need for them to do so as yet.

Over half of last week's bookings at CHICAGO, including strip, plates, shapes, bars and sheets, went to the implement and tractor manufacturers, reports one sales office. Structural fabricators in the CHICAGO area are expecting a good improvement in the near future. Heavy tonnages of shapes and plates for pipe lines remain to be placed by the PWA.

For steel producers at YOUNGSTOWN and CLEVELAND, January so far has held up better than expected. Purchases of finished steel are moderate but fairly consistent from miscellaneous consumers, which is helping to offset automotive releases slightly decreased from normal requirements.

Sales of finished steel at CLEVELAND and YOUNGSTOWN so far this month are holding even with the volume in the comparable December period. Shipments are running below those of the previous month. The bar markets are among the most active. Merchant bar sales during the first two weeks of January were in excess of the same December period, while several large reinforcing bar awards in OHIO have contributed to activity in that division.

Aggregate bookings of all types of steel products in the PHILADELPHIA district are currently on about a level with the average for December. Most producers are not quite so optimistic as they were prior to the turn of the year, the general opinion being that if the first quarter equals the last quarter of 1938 there will be much to be thankful for. Some talk regarding second quarter prices is going the rounds, practically all of which is wishful thinking to the end that increases might be made.

So far, New Year hopes have not been realized in the southern Ohio steel market. Sales, except to jobbers, have been averaging about 45 per cent, on a parity with early December.

Steel interests predict a rise in bookings in early February.

Orders that have been pent up because of a desire to hold down inventories for 1938 are beginning to come out at ST LOUIS, but so far the volume is light, and most business is being placed for jobs that are in hands of steel buyers.

New tonnage is being booked at a fair rate at BIRMINGHAM. Railroad orders are disappointing, but additional business is expected before the end of the month. The prospect for bars and structural steel business during the next two or three months is good on account of new construction now starting in the SOUTH.

SEMI-FINISHED STEEL

. . . Moderate improvement in orders at Pittsburgh

A MODERATE increase in specifications materialized at PITTSBURGH during the past week. A gain in tin and sheet bar demand made up most of the improvement. There is no indication, however, that buyers are covering forward needs as purchases continue on a hand-to-mouth basis.

Demand for semi-finished in the CLEVELAND area is very quiet and apparently will remain so until non-integreated mills find orders picking up. While some semi-finished producers have been able to build up their stocks during recent weeks, inventories generally are none too heavy.

STRUCTURAL STEEL

. . . American Bridge takes 2900-ton Richmond school contract

AWARDS and inquiries at several points, such as PITTSBURGH, have dropped off somewhat while specifications continue to expand. American Bridge Co. was awarded a 2900-ton contract for a college building at Richmond, Va., while Carnegie-Illinois Steel Corp. will furnish 1170 tons of steel sheet piling for Housatonic River bridge construction at Stratford, Conn. Ingalls Iron Works Co. will provide 1700 tons for a Newington, Conn., veterans' home.

Lettings in the NEW YORK area last week were light, the largest being 900 tons for a Bloomfield, N. J., junior high school, to the Schaefer Iron Works. Largest inquiry in that area was 1500 tons for a Queens, N. Y., Hospital. Upstate New York reports no new projects. Bidding date for the Fredonia normal school has been changed to Jan. 25 and for the school at Levonia, N. Y., to Jan. 20.

Considerable structural tonnage remains to be placed under the PWA in the vicinity of CHICAGO where a change of plans has reduced the needed tonnage for the third section of the Chicago subway to a negligible amount. On the WEST COAST structural steel for Unit 4 of the Lake Washington pontoon bridge, Seattle, is slated for early letting; 1367 tons is involved. An overcrossing at Albany, Ore., requiring 600 tons, is the largest new project announced on the Coast where several highway projects are under way.

Plans for the SAN FRANCISCO parcel post office are in the drawing stage and bids should be called for in the near future involving major tonnages in both structural and reinforcing steel. Plans for the SEATTLE post office are in the specifications stage, and bids are expected to be called for soon. The 11th Naval District has announced plans for constructing a 400-ft. graving dry dock at the detroyer base at San Diego during the present year.

Market Sidelights

Carnegie-Illinois Steel Corp. has announced plans for resuming operation of blast furnace No. 1 at the Clairton, Pa., works. With addition of this furnace, Carnegie-Illinois will have 14 blast furnaces in operation in the Pittsburgh district.

* * *

Continental Motors Corp., Detroit, booked more than $1,000,000 worth of business in the first week of the new year. It has been learned that the agricultural engine division alone obtained contracts totaling $690,000 from the leading farm implement manufacturers. One of the orders represents a new account.

PLATES

. . . Market quiet; Boston water tunnel award expected shortly

COMMERCIAL SHEARING & STAMPING CO., Youngstown, has been awarded 2963 tons for a section of the Delaware Aqueduct. Approximately 5000 tons of plates are included in awards expected to be made shortly for steel to be used in cylinder reinforced concrete pipe for a pressure aqueduct to be constructed by the Boston Metropolitan District Water Supply Commission. The Lock Joint Pipe Co., Ampere, N. J., is the builder.

Following a drastic holiday letdown in orders in eastern PENNSYLVANIA, demand has shown a tendency to expand to December's level. Little new export tonnage is now in the market, although a few hundred tons have recently been placed at prices ranging from 1.71c. to 1.75c. a lb., f.a.s. In the NEW YORK area plate volume continues low, with exception of recent tonnages placed by the American Car & Foundry Co. for shipment to its St. Louis plant.

Low bidder on two Bureau of Reclamation siphons at Corbett, Wyo., requiring a total of 4000 tons, was Consolidated Steel Corp., Los Angeles.

CHICAGO mills are hopefully regarding the Union Pacific's inquiry for 1000 to 2000 50-ton box cars either to be purchased or built in the road's own shops. About 3000 tons of liner plates and rib beams will be called for in the third section of CHICAGO's new subway.

TIN PLATE

. . . Operations at 41% . . . Buying pickup is slow

OPERATIONS continue at around 41 per cent and new business is about on a par with a week ago. Although the presence of canned goods carryovers is causing a precautionary note in buying, tin plate makers still look for substantial purchases later in the quarter, possibly next month.

REINFORCING BARS

. . . 15,000 tons of rods to be used in Boston water project

ABOUT 15,000 tons of reinforcing rods, in addition to about an equal amount of other steel products, will be used in the construction of 15 miles of concrete pipe for the Boston Metropolitan Water Supply Commission. The contract was awarded to the Lock Joint Pipe Co., Ampere, N. J., on its bid of $4,164,126.50.

The Bureau of Reclamation has awarded 2460 tons of reinforcing bars to the San Francisco office of Bethle-

hem Steel Co. for a power house at Shasta Dam, California.

The second section of the Chicago subway will require 2750 tons of bars, on which bids have been taken, but the award has not been announced. The third section, on which bids are due Feb. 2, will take 2450 tons.

The West Virginia Rail Co. was awarded 825 tons for a flood wall at Kenova, W. Va.

The 840 tons required by the Federal Government housing project at YOUNGSTOWN will be supplied by Concrete Steel Co. At CLEVELAND the 486 tons of rail steel bars for the new Veterans Hospital will be supplied by Bethlehem Steel Co.

Lettings in the NEW YORK area in the past week were numerically greater than in the preceding week, but tonnages involved were very small. There are a number of public projects yet to be let in that area, with the Bowery Bay sewage treatment plant, calling for 1600 tons, outstanding. Small lot buying has shown a sharp drop from the December level, one seller estimating the extent of this decline at 50 per cent. Substantial concessions below the published price are still available on fair-sized jobs.

MERCHANT BARS

. . . orders are slightly better . . .

Demand miscellaneous

SOME slight support to hot rolled bar sales was noted at PITTSBURGH in the past week. Demand continues miscellaneous and in some cases represents accumulations from holiday lethargy. Automotive requirements are not large but improved buying from this quarter is expected next month.

CLEVELAND and YOUNGSTOWN producers report a consistent volume of moderate purchases prevailing. In the former district, business up to Jan. 15 was approximately 10 per cent ahead of the corresponding part of December.

CHICAGO sellers report good bar demand. Automobile, farm implement and tractors, jobbers, and miscellaneous sources are providing the stimulus. One company last week had the most business from forgers in some time.

The most attractive bar order in some months in the PHILADELPHIA area was placed on Friday by Frankford Arsenal. The order involved 1550 tons of 2⅜-in. hot rolled rounds, 0.3 to 0.4 carbon, for mortar shells. All bids were completely in line, $3.47 per 100 lb., and Carnegie-Illinois received the order because of ability to ship 1500 pieces within three days. Otherwise, the EASTERN PENNSYLVANIA district has had little business to figure on.

RAILROAD BUYING

. . . Union Pacific to buy 100,000 tons of rails and fittings, also box cars

THE Union Pacific Railroad has inquired for 100,000 tons of rails and accessories, of which about 74,000 tons will be rails. It is understood that the orders have been allocated, but formal contracts have not been issued. Chicago and Colorado mills will roll the rails, but some of the accessory business will go to Pacific Coast mills. The Union Pacific is also asking bids on 1000 to 2000 50-ton box cars.

Other rail buying includes 12,500 tons placed by the St. Louis-San Francisco with the Tennessee Coal, Iron & Railroad Co. and 4000 tons placed by the Seattle, Portland & Spokane with the Colorado Fuel & Iron Corp. It is understood that the Southern Pacific's rail orders will total about 25,000 tons.

The Pittsburgh & West Virginia is inquiring for 300 hopper cars and 100 box cars. This inquiry is a revision of one issued a month ago. This road will also rebuild 320 hopper cars in its own shops. Steel required for the new cars and repair program will total about 7500 tons. Modernizing of about 100 passenger cars by the Pennsylvania at its Altoona shops will take about 1500 tons of steel.

The Rock Island's budget for 1939 provides $32,412,000 for improvement of roadway and equipment and maintenance, exclusive of purchases of new equipment, which is still indefinite. About 45,000 tons of new rails will be required and considerable bridge construction will be undertaken.

The Federal Court at St. Louis has approved the 1939 budget of the St. Louis-San Francisco Railway amounting to $2,306,421, with salvage and other retirement values amounting to $906,741, making the net $1,078,914. The details of the budget were given in THE IRON AGE of Dec. 15.

Electro-Motive Corp. has received orders for three diesel-electric switching locomotives; one from the Fort Worth Belt Line and two from the Erie. American Locomotive Co. has booked an order for three diesel-electric locomotives from the Minnesota Transfer.

New inquiries include seven freight cars for National Tube Co. and 10 to 15 chair cars for the Union Pacific.

On a recent Navy Department inquiry for four freight cars, Greenville Steel Car Co. was low on two box cars and Magor Car Corp. was low on two flat cars.

The a. c. f. Motors Co. has received orders for 25 motor coaches as follows: 18 for Philadelphia Rapid Transit Co., Philadelphia; five for Gary Railways Co., Gary, Ind.; one for Cooke Street Line, Waterbury, Conn., and one for Williamsport Transportation Co., Williamsport, Pa.

The Federal court at St. Louis authorized the Missouri Pacific Railway and its subsidiaries to expend $8,560,864 during 1939 for the purchase of 28,290 tons of 131, 112 and 90-lb. rails, 880,000 tie plates and 553,000 rail anchors for parent company; 500 tons 112-lb. rails, 21,000 tie plates, 11,000 rail anchors for Missouri Pacific in Nebraska totaling $2,913,600; 2250 tons 90-lb. rails and accessories, for Gulf Coast Lines, $116,700; 450 tons, 122-lb. rails and accessories, for International Great Northern, $26,370; freight cars, $25,000; passenger cars, $51,200; work equipment, $40,710, miscellaneous equipment $41,860, and improvements to existing equipment, $966,770; shop machinery and tools, $110,755; signals and interlocking plates $149,930 also are listed for parent company. Improvements for 1939 for the parent company totaling $4,623,000 were suggested by the trustee, in addition to the budget, as follows; two 900-hp. diesel electric locomotives, for Union Lincoln line, $198,000; three 900-hp. and two 600-hp. diesel switch locomotives for St. Louis terminal, $381,000; two streamline passenger trains, locomotives, $360,000, and cars, $984,000; 1000 50-ton flat bottom gondolas, $2,700,000, and for the Missouri & Illinois, 250 50-ton box cars and 50 50-ton coal cars, $860,000, on which no action was taken.

SHEETS AND STRIP

. . . Buying lags somewhat, awaiting new automotive commitments

FLAT rolled makers are marking time in anticipation of automotive buys which are expected some time in February. Aggregate demand at PITTSBURGH is up slightly from a week ago but tonnages being placed are far from satisfactory. Miscellaneous orders are not coming up to expectations, but this is probably because consumers want to gage more

closely the possible movement of their own products this spring. All these factors put emphasis on hand-to-mouth buying but most sheet makers believe total sales will increase slowly over the next few weeks with a substantial bulge when and if auto makers turn their hopes into firm contracts.

Demand at CLEVELAND and YOUNGSTOWN continues moderately active, consisting mostly of small orders for immediate fabrication by miscellaneous manufacturers. Incoming business during the first half of January was comparable to the volume received during the corresponding December period.

CHICAGO mills are receiving some automobile business but no large buying has been seen recently. A dearth of orders in sheets and tin plate has been chiefly responsible for a sharp curtailment in operations at one large district mill over the past two weeks. There would seem to be some indications at the moment that automobile activity is lessening and may continue slightly down for a few weeks. A new small car to compete with the Big Three will soon be announced by Studebaker.

With automotive buying still fairly light, sheet steel is holding to the market average bookings of about 45 per cent, in southern Ohio. Household appliance and some foreign ordering is most prominent, although other miscellaneous sources are present. Consumers show tendency to clear inventories before making new commitments.

There was a fair pickup in sheet sales in the NEW YORK area the past week, some district offices reporting double the volume of the first week in January. Most of the increase in new business came from jobbers.

The Bureau of Supplies and Accounts, Navy Department, will open bids on Jan. 27 for 1100 tons of sheets for stock at various Navy yards and naval stations.

BOLTS, NUTS, RIVETS

. . . Real test of prices expected next month

CURRENT orders are a trifle above expectations, according to producers at CLEVELAND. The real test of bolt and nut prices is expected in February, but in the meantime on such business as is going prices are reported holding up well. Present automotive releases represent a slight decrease from normal requirements.

Dollar sales and actual shipments of cap and set screw producers are running ahead of those of December. The new cap and set screw prices are being tested and holding favorably. Rivet orders are reported better than at any time since the first part of December, some tonnage being received from railroad equipment builders and car shops.

WIRE PRODUCTS

. . . Manufacturers requirements expanding . . . Merchant sales slow

MERCHANT wire demand at PITTSBURGH remains sluggish but requirements for manufacturers' wire have expanded slightly in the past week. The improvement in manufacturers' wire orders emanates from miscellaneous sources and, although tonnages are not large, diversification has expanded.

CLEVELAND producers report tonnage continues spotty, but in the aggregate is not any worse than other divisions of the steel industry. Led by specifications for manufacturers' wire, order books are comparable with the December volume.

COLD FINISHED BARS

. . . Jobber buying lag . . . Detroit warehouses cut prices

JOBBER buying still lags and producers continue to await additional support from automotive interests. Home appliance makers are slow in ordering and little or no support is coming from farm implement makers. Some producers are not unduly worried since it is believed many consumers are holding up orders until they judge the trend for their own operations.

Price cutting by jobbers in Detroit has upset the trade there. One jobber reduced its prices 25c. per 100 lb. and another countered with a 50c. cut.

TUBULAR GOODS

. . . Movement to jobbers' stocks not heavy

LITTLE or no change in pipe sales has been noted at PITTSBURGH. Standard pipe demand continues to reflect building activity but movement of pipe to jobbers' stocks is not unusually heavy. Locomotive boiler tube demand will gain some help from railroad repair programs and also from recently placed orders for new locomotives.

Orders, production, and shipments in the CLEVELAND territory are holding their own, aided by the release of some oil company buying and fair demand for standard pipe. A firmer price structure appears more than a possibility in the opinion of sellers.

Imports at Philadelphia

PHILADELPHIA—The following iron and steel imports were received here during the past week: 300 tons of ferromanganese from the Netherlands; 14 tons of steel tubes, three tons of steel billets and three tons of steel bars from Sweden.

Weekly Bookings of Construction Steel

	Week Ended				Year to Date	
	Jan. 17, 1939	Jan. 10, 1939	Dec. 20, 1938	Jan. 18, 1938	1939	1938
Fabricated structural steel awards	22,400	19,600	49,700	15,200	78,100	38,250
Fabricated plate awards	3,970	6,900	1,250	3,840	11,345	4,880
Steel sheet piling awards	1,320	215	1,000	0	1,535	0
Reinforcing bar awards	19,755	10,250	8,925	1,900	31,405	15,715
Total Letting of Construction Steel..	47,445	36,965	60,875	20,940	122,385	58,845

. . . PIPE LINES . . .

Corpus Christi Recycling Corp., Corpus Christi, Tex., plans new welded steel pipe line from gas recycling plant to point near turning basin at Corpus Christi, about 35 miles, for gasoline transmission, to include booster station and other operating facilities.

Dixie Pipe Line Co., Magnolia, Ark., has authorized welded steel crude oil pipe line from oil field area near Magnolia to connection with main pipe line system of Ohio-Arkansas Pipe Line Co., which extends to Haynesville, La., where further connection will be made with line to Houston, Tex. Line will be about eight miles long, equally divided into 4 and 6-in. pipe. A steel pipe line gathering system in oil field district also will be built with pumping station to provide a capacity of about 20,000 bbl. per day.

General Purchasing Officer, Panama Canal, Washington, closes bids Jon. 30 for 26,320 ft. of galvanized welded steel pipe and 2340 ft. of welded steel pipe (Schedule 3415).

Bay St. Louis, Miss., has let contract to Littrell Contracting Co., Opelousas, La., for steel pipe line system for municipal natural gas distribution, including welded steel pipe line for connection with supply source, control station and other operating facilities. Cost close to $200,000. F. P. Joseph, Glenmora, La., is consulting engineer.

Public Service Electric & Gas Co., Public Service Terminal, Newark, N. J., plans new 24-in. trunk main from Belleville to Montclair, N. J., for artificial gas transmission in latter area, providing increased supply for that place, Verona, Caldwell and vicinity, to which points extensions and connections will be made. This is part of a 1939 expansion and improvement program in gas line and service extensions, and electric line and service extensions, for which a total fund of about $4,000,000 has been authorized.

Metropolitan Water District, Los Angeles, has let contract to Western Pipe & Steel Co., 5717 Santa Fe Avenue, for steel pipe lines for lateral feeder system at Long Beach, Compton and Torrance, Cal., at $366,317.

Board of Contracts and Awards, Tacoma, Wash., has let contract to American Concrete & Steel Pipe Co., 459 East Fifteenth Street, for furnishing and installing 9580 lin. ft. of 58-in. i.d. coal tar enameled steel pipe, at $207,045.

. GREAT BRITAIN .

. . . *Business slow in developing . . . Canadian tin plate orders not placed yet.*

LONDON, Jan. 17 (*By Cable*)—Market is still quiet. Consumers are not hurrying as prices are fixed for six months at least. It is hoped that the Rome conversations may result in a broadening of hematite trade with Italy, as only a lack of credits is preventing business.

Air raid precaution shelter orders are still under negotiation and merchant shipbuilding is still virtually stagnant.

Tin plate demand is improving slowly, but unfilled orders are still only 2,000,000 base boxes. The usual big Canadian order has not yet been placed, but is expected as the Welsh price for Canada has been reduced 30c. to $5.35 per 100 lb., c.i.f., Eastern Canada ports.

The Continent reports poor steel trading so far this year, but sentiment is now more cheerful, and improvement is anticipated provided the international situation settles.

December imports of iron and steel amounted to 53,000 tons of which 5700 tons came from the United States. The 1938 total of imports was 1,340,000 tons, of which 200,500 came from the United States. The year's scrap imports amounted to 630,000 tons.

December exports of pig iron amounted to 13,000 tons, making the year's total 94,000 tons, of which only 42 tons went to the United States. December black sheets amounted to 5200 tons; year's total, 63,000 tons. December galvanized sheets amounted to 13,800 tons; year's total, 147,000 tons. December tin plate amounted to 27,000 tons; year's total, 319,400 tons. December, all kinds of iron and steel, amounted to 162,400 tons; year's total, 1,917,000 tons.

. . . CANADA . . .

. . . *Iron and steel buying showing moderate improvement.*

TORONTO, Jan. 17.—New business is developing steadily in the Canadian iron and steel markets and sales are showing improvement over those for the closing weeks of the year. Automotive buying is fairly heavy with a number of good contracts pending. Building trades also are showing improvement and there has developed a better demand for structural steel in small quantity lots, although fabricators do not look for big business in this line until early spring. General demand for steel is expanding steadily, though most consumers are holding orders to small quantities during the inventory-taking period.

V. M. Drury, president of Canadian Car & Foundry Co., Montreal, states that his company has airplane contracts sufficient to keep the plant operating for two years, and other similar business is pending. Contracts for airplanes and war supplies are expected to provide considerable work for Canadian companies during the year.

Improvement in general business in Canada is reflected in increased demand for merchant pig iron and sales have been moving up steadily, according to local blast furnace representatives. Five stacks remain in blast.

CAST IRON PIPE

Washington Suburban Sanitary District, Hyattsville, Md., plans pipe line extensions and improvements in water system in Prince George and Montgomery Counties, and other waterworks installation. Bond issue of $600,000 is being arranged for this and sewage system work.

Gilman, Wis., asks bids until Jan. 27 for 3828 ft. of 8-in., and 9986 ft. of 6-in. pipe for water system, with alternate bids on cast iron, bell and spigots; cast iron, bolted joints; cast steel, lined and coated; and cement-asbestos; also for 40,000-gal. steel tank on steel tower, with alternates on wood tank on steel tower; and alternates on 50,000-gal. steel tank; gate valves, water meters, fire hydrants, etc. Frank J. Davy & Son, 502 Main Street, LaCrosse, Wis., are consulting engineers.

Whitehall, Mich., plans pipe lines for water system in Division Street. Cost about $27,000. Special election has been called on Mar. 13 to vote bonds in that amount.

Jackson, Wyo., plans pipe lines for water system and other waterworks installation. Fund of $49,870 has been secured through Federal aid. Work is scheduled to begin soon.

Purchasing Agent, Bureau of Reclamation, Denver, asks bids until Jan. 23 for cast iron pipe (Circular 47439-A).

Lakeland, Fla., plans pipe line extensions and improvements in water system, and other waterworks installation. Fund of about $370,000 is being arranged for this and extensions and betterments in municipal power system, of which $167,000 is being secured through Federal grant.

Austin, Tex., has rejected bids recently received for pipe line extensions in water system and pumping station, and will ask new bids soon.

Western Star, Ohio, has authorized surveys and estimates of cost for pipe lines for municipal water system and other waterworks installation. E. G. Barstow, 31 North Summit Street, Akron, Ohio, is consulting engineer.

Leitchfield, Ky., has arranged for purchase of local water system heretofore privately owned, and plans extensions in pipe lines for water supply in new districts. Fund of $70,000 has been arranged, of which $31,500 will be a Federal grant.

Front Royal, Va., plans pipe line extensions in water system. Special election will be called soon to vote bonds for $110,000 for this and extensions and improvements in sewage system.

Carson, Iowa, plans 2-in. pipe for extensions in water system. Financing is being arranged.

Durant, Okla., plans pipe line extensions in water system, totaling about 10 city blocks. R. G. Clack, superintendent of water department is in charge.

Laguna Beach, Cal., water system pipe, comprising 4200 ft. of 8-in., 10,400 ft. of 6-in., 19,000 ft. of 4-in., and 7200 ft. of 2-in. has been awarded to American Cast Iron Pipe Co., Los Angeles, through J. L. Kruly, Los Angeles, contractor.

Hillsborough, Cal., has awarded 700 tons of 4, 6, 8, and 10-in. pipe and fittings to United States Pipe & Foundry Co., San Francisco.

Oakland, Cal., East Bay Municipal Water District has taken bids on 796 tons of 4 and 6-in. pipe, with American Cast Iron Pipe Co. low on 160 tons, United States Pipe & Foundry Co. low on remainder.

. . . NON-FERROUS . . .

. . . December copper deliveries down 16,877 tons in December . . . Lead and zinc demand sporadic; prices unchanged.

NEW YORK, Jan. 17—The unfavorable position of domestic copper was further accentuated in the past week by the issuance of the December statistics. These figures showed that at the end of the month domestic refined stocks had been built up 289,755 tons, as compared with 269,488 at the end of November, due primarily to a drop in deliveries of 16,877 tons to 47,680 tons. This was the second consecutive decline in shipments from the year's high of 82,605 in October. Refined production in December, at 67,947 tons, was little changed from the November total of 66,746 tons. Marketwise, there is little to report. Sales continue very light, the week's total being about 3400 tons. Producers' quotations are unchanged at 11.25c. per lb., Connecticut Valley, but in view of further weakness in the foreign price the trade is anticipating some adjustment in the domestic level. This expectation is undoubtedly one of the major factors holding back buyers at the present time. This morning's moderate foreign business was done in the neighborhood of 10.25c. per lb., c.i.f., usual base ports, as compared with 10.32c. a week ago.

Lead

The daily market in the past week ranged from extreme dullness to a volume sufficient to absorb sellers' intakes. For the week as a whole, business was below the previous week. Most consumers have covered to a point where the needs of all business in sight are protected and the present tapering of sales is not considered indicative of any new trend. Shipments are moving into consumption at a pace that indicates another 40,000-ton month. The domestic price is firm and unchanged at 4.85c. per lb., New York, while this morning's London price of 3c. on spot is five points below a week ago.

Zinc

Demand during the week was very spotty, with sales spread fairly evenly from spot into the second quarter. The week's prime Western business totaled 2259 tons against 2974 in the previous week, while shipments amounted to 3958 tons against 2974 tons. The unsettling effect of the import duty reduction is still evident in the market, although at the present level the domestic quotation of 4.89c. per lb., New York, is safely above the import parity. This morning's London price was 2.87c. per lb. on prompt metal, as compared with 2.80c. a week ago.

Tin

Outside of a temporary bulge on Saturday, brought about by the improvement in stock prices on that day, sales have been very light all week. Small fill-in lots are being booked constantly, but the lack of a definite trend in industrial operations is causing industrial buyers to exercise extreme caution in making purchases. Prices continue their sidewise movement, with today's Straits price of 46.50c. per lb., New York, being little changed from the price of a week ago. On first call in London this morning cash standards were quoted at £215 10s as against £216 10s a week ago.

NON-FERROUS PRICES

Cents per lb. for early delivery

	Jan. 11	Jan. 12	Jan. 13	Jan. 14	Jan. 16	Jan. 17
Copper, Electrolytic[1]	11.25	11.25	11.25	11.25	11.25	11.25
Copper, Lake	11.375	11.375	11.375	11.375	11.375	11.375
Tin, Straits, New York	46.65	46.65	46.50	....	46.50	46.50
Zinc, East St. Louis[2]	4.50	4.50	4.50	4.50	4.50	4.50
Lead, St. Louis[3]	4.70	4.70	4.70	4.70	4.70	4.70

[1] Delivered Conn. Valley, deduct ¼c. for New York delivery. [2] Add 0.39c. for New York delivery. [3] Add 0.15c. for New York delivery.

Warehouse Prices

Base per lb., Delivered

	New York	Cleveland
Tin, Straits pig	47.50c.	49.75c.
Copper, lake	12.25c.	12.375c.
Copper, electro	11.50c.	12.375c.
Copper, castings	11.25c.	11.875c.
*Copper sheets, hot-rolled	19.375c.	19.375c.
*High brass sheets	17.31c.	17.31c.
*Seamless brass tubes	20.06c.	20.06c.
*Seamless copper tubes	19.875c.	19.875c.
*Brass rods	12.62c.	12.62c.
Zinc slabs	6.25c.	7.25c.
Zinc sheets, No. 9 casks	10.50c.	12.10c.
Lead, American pig	5.60c.	5.60c.
Lead, bar	6.275c.	8.50c.
Lead, sheets, cut	8.00c.	8.00c.
Antimony, Asiatic	15.00c.	17.75c.
Alum., virgin, 99 per cent plus	22.50c.	22.50c.
Alum., No. 1 remelt., 98 to 99 per cent	19.50c.	19.50c.
Solder, ½ and ½	28.80c.	29.10c.
Babbitt metal, commercial grade	22.75c.	22.50c.

* These prices, which are also for delivery from Chicago warehouses, are quoted with the following percentages allowed off for extras: on copper sheets, 33 1/3; on brass sheets and rods, 40, and on brass and copper tubes, 25.

Old Metals Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators. Selling prices are those charged to consumers after the metal has been prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	8.00c.	8.75c.
Copper, hvy. and wire	7.00c.	7.50c.
Copper, light and bottoms	6.25c.	6.50c.
Brass, heavy	4.25c.	4.75c.
Brass, light	3.375c.	4.125c.
Hvy. machine composition	6.125c.	7.625c.
No. 1 yel. brass turnings	4.125c.	4.625c.
No. 1 red brass or compos. turnings	5.875c.	6.50c.
Lead, heavy	3.625c.	4.50c.
Cast aluminum	7.00c.	8.25c.
Sheet aluminum	11.75c.	13.25c.
Zinc	2.25c.	3.50c.

Miscellaneous Non-Ferrous Prices

ALUMINUM, delivered; virgin 99 per cent plus, 20c.-21c. a lb.; No. 12 remelt, No. 2 standard, 19c.-19.50c. a lb. NICKEL, electrolytic, 35c.-36c. a lb. base refinery, lots of 2 tons or more. ANTIMONY, prompt, New York; Asiatic, 14c. a lb., f.o.b.; American, 11.75c. a lb. QUICKSILVER, $77 per flask of 76 lb. BRASS INGOTS, commercial 85-5-5-5, 10.50c. a lb. lcl.

Gehnrich & Gehnrich, Inc., 32 57th Street, Woodside, N. Y., has appointed as representative covering its line of industrial ovens, dryers, air heaters and other equipment Gustav Schwab, of Schwab Industrial Laboratories, Elizabeth, N. J., for northern New Jersey and all of New York State except metropolitan New York City. W. W. Young, Waterbury, Conn., will represent the firm in Connecticut, Massachusetts and Rhode Island.

IRON AND STEEL SCRAP

. . . Technical advance at Chicago raises composite 8c. to $15 . . . Most markets are extremely quiet, however.

JAN. 17.—Both strength and weakness can be discerned in the present market, which is extremely quiet all over the country. No mill sales of any importance have been made, but shipments have returned to normal in most consuming centers. Based upon what brokers are paying in CHICAGO to lay down material, a flat $14 is quoted there, making a 25c. advance in the average for No. 1 steel. The range was $13.50 to $14 last week. With no changes in the prime grade at PITTSBURGH and PHILADELPHIA, the composite is advanced 8c. to $15, the same figure that prevailed on Nov. 22, 1938, and the high point of last year. Despite this technical advance in the average, weaker tendencies are reported at Buffalo and Cincinnati and sentiment in that direction is increasing at Philadelphia. Detroit brokers showed little interest in bidding on bundles offered by a body company on Monday.

Export buying prices are firm.

Pittsburgh

The market undertone continues strong, with this analysis having been borne out last week by the higher consuming prices paid on recent railroad lists. Ordinary No. 1 heavy melting steel remains unchanged at $15.50 to $16, although over $16 a ton has been paid at some points in the district. Small amounts have been offered for consumption in the immediate Pittsburgh district at less than $15.50. However, a substantial tonnage of steel would probably bring a price close to the top of the current No. 1 quotations.

Chicago

Extreme quiet prevails in this district. Brokers are paying $14 a ton for heavy melting steel and some dealers have gone to $14.25. It is considered doubtful by some that a mill could buy today for $14. Supplies are not tight, however, so that a resumption of mill interest in large tonnages will not cause a runaway market. The next mill sales are expected to be either at $14 or $14.50. No. 1 steel is quoted this week at a flat $14.

Philadelphia

One export boat cleared Port Richmond Monday morning and another docked in the evening. No other boat is expected for at least a fortnight. Most of the steel for January export loadings has been accumulated and for that reason few additional purchases are being made. The domestic market is completely inactive with the exception of spotty activity of a modest nature in specialties and foundry items. In view of the fact that steel-making operations will likely show little improvement over the next three or four weeks, sentiment on the weak side is on the increase, and it is probable that many items on the list would show lower values if sufficient test sales could be developed to adequately establish the market.

Youngstown

Shipments at some points in the Valley have returned practically to the level prevailing in late November, resumption of additional open hearths having forced embargoes to be lifted. The market retains a very strong undertone and dealers' buying prices have firmed up. No. 1 heavy melting steel is unchanged at $15 to $15.50 a ton.

Cleveland

As open-hearth activity is holding up well here, sentiment is stronger in the scrap market. Dealers' buying prices are firm. No. 1 heavy melting steel remains quoted at $14 to $14.50 a ton.

Buffalo

While weaker tendencies may be discerned in the market, no actual sales at lower than quoted prices are reported. No. 1 heavy melting steel continues at $13.75 to $14.25 a ton. Specialties are moving at about the same rate. An increase in mill operations, anticipated soon, is expected by dealers to revive activity.

St. Louis

The Institute of Scrap Iron and Steel having been in annual convention here last week, dealers gave little thought to business, and it was unusually quiet. Prices are unchanged. Railroad lists: Louisville & Nashville, 4744 tons; Wabash, 3500 tons; Ann Harbor, 325 tons; Missouri-Kansas-Texas, 1200 tons; Southern, 2500 tons; Standard Oil Co. (Wood River, Ill.) 45 tons, and St. Louis-San Francisco, 840 tons.

Cincinnati

While all mill interests in Southern Ohio have bought small amounts of old materials in the past week, the market is not resilient. Dealers' bids are firm, but lack of business contributes a weaker undertone.

Detroit

Prices of scrap in the Detroit area moved sidewise, with most of the local brokers not showing a great deal of interest in bidding on a body company list which closed Monday.

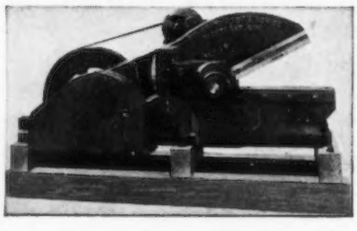
New York

Dealers' buying prices are unchanged for both domestic and export shipment. The market is quiet and little change is looked for in the near future. Shipments abroad continue at a steady pace. The matter of the disposition of the scrap of the Sixth Avenue "L" has not been finally settled by Harris Structural Steel Co., which has the contract for the demolition. It is understood, however, that part of the tonnage is being shipped to an eastern Pennsylvania mill.

Boston

The Washburn Wire Co., Phillipsdale, R. I., is operating all three of its furnaces and is still in the market for No. 1 steel at $14.50 a ton, delivered, and No. 2 at $14. The Weirton Steel Co. is obtaining an occasional car of steel turnings and bundled skeleton in this market, but Pittsburgh district mills generally and eastern Pennsylvania mills are not a market factor at the moment, and the American Steel & Wire Co., Worcester, has withdrawn from the market. The export market continues active with prices firm and unchanged. The General Scrap Co., Providence, is loading a boat at that port. The boat will finish loading at Boston. For Rotterdam 2568 tons and for Poland 721 tons have just sailed from here. A boat with 3400 tons loaded at Portland, Me., is taking 2500 tons additional here for delivery at Hamburg, Germany. The Socony-Vacuum Oil Co. has sold two sizable tankers to the Northern Metals Co., Baltimore, for scrapping.

A NEW low-priced alligator type busheling shear is being made by the Canton Foundry & Machine Co., Cleveland. With longer knives and larger jaw opening than heretofore available on low-priced shears, the machine's speed of 50 cuts per min. is said to make short work of skeleton scrap, pipe up to 2 in., round or square bars up to 1½ in., light sheets, auto bodies, fenders and miscellaneous scrap for busheling.



J. & L. Mill Operates Despite $20,000 Fire

PITTSBURGH.—Flames at an explosion port in a gas main, caused by static electricity when a new gas machine was being cut in at Jones & Laughlin Steel Corp.'s sheet and strip mill Tuesday, resulted in property damage of $20,000 and injured six men, none seriously. Mill operations and shipments which were not affected continued on a normal schedule. The damaged gas machine, used to supply a reducing atmosphere in the furnaces while sheets are being annealed, was replaced. Major damage included roof and parts of the mill building around the area affected by the explosion, wiring, and the gas machine.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$15.50 to	$16.00
Railroad hvy. mltng...	16.50 to	17.00
No. 2 hvy. mltng. steel.	14.25 to	14.75
Scrap rails	17.00 to	17.50
Rails 3 ft. and under..	17.50 to	18.00
Comp. sheet steel	15.50 to	16.00
Hand bundled sheets..	14.50 to	15.00
Hvy. steel axle turn..	14.00 to	14.50
Machine shop turn....	9.75 to	10.25
Short shov. turn.....	10.50 to	11.00
Mixed bor. & turn....	8.25 to	8.75
Cast iron borings.....	8.25 to	8.75
Cast iron carwheels...	15.00 to	15.50
Hvy. breakable cast...	12.50 to	13.00
No. 1 cupola cast.....	15.25 to	15.75
RR. knuckles & cplrs.	16.50 to	17.00
Rail coil & leaf springs	17.50 to	18.00
Rolled steel wheels...	17.50 to	18.00
Low phos. billet crops.	18.50 to	19.00
Low phos. punchings.	17.50 to	18.00
Low phos. plate	17.00 to	17.50

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$15.00 to	$15.50
No. 2 hvy. mltng. steel.		13.50
Hydraulic bund., new.	14.50 to	15.00
Hydraulic bund., old..	11.50 to	12.00
Steel rails for rolling.	17.00 to	17.50
Cast iron carwheels...	16.50 to	17.00
Hvy. breakable cast...	....	16.00
No. 1 cast.....	16.50 to	17.00
Stove plate (steel wks.)	13.00 to	13.50
Railroad malleable ...	15.50 to	16.00
Machine shop turn....	8.50 to	9.00
No. 1 blast furnace....	6.50 to	7.00
Cast borings	6.50 to	7.00
Heavy axle turnings..	10.00 to	10.50
No. 1 low phos. hvy...	16.50 to	17.00
Couplers & knuckles..	16.50 to	17.00
Rolled steel wheels ...	16.50 to	17.00
Steel axles	21.50 to	22.00
Shafting	20.00 to	20.50
Spec. iron & steel pipe	12.00 to	12.50
No. 1 forge fire	11.00 to	11.50
Cast borings (chem.)..	9.50 to	10.00

CHICAGO

Delivered to Chicago district consumers:

		Per Gross Ton
Hvy. mltng. steel	....	$14.00
Auto. hvy. mltng. steel alloy free	$12.00 to	12.50
No. 2 auto. steel	11.50 to	12.00
Shoveling steel	13.50 to	14.00
Factory bundles	12.75 to	13.25
Dealers' bundles	12.00 to	12.50
Drop forge flashings..	11.50 to	12.00
No. 1 busheling	12.00 to	12.50
No. 2 busheling, old..	5.75 to	6.25
Rolled carwheels	15.25 to	15.75
Railroad tires, cut....	16.25 to	16.75
Railroad leaf springs..	15.75 to	16.25
Steel coup. & knuckles	15.25 to	15.75
Axle turnings	12.75 to	13.25
Coil springs	16.75 to	17.25
Axle turn. (elec.)	13.75 to	14.25
Low phos. punchings..	15.75 to	16.25
Low phos. plates 12 in. and under	15.25 to	15.75
Cast iron borings	5.25 to	5.75
Short shov. turn.	7.00 to	7.50
Machine shop turn....	7.00 to	7.50
Rerolling rails	17.00 to	17.50
Steel rails under 3 ft..	15.75 to	16.25
Steel rails under 2 ft..	16.25 to	16.75
Angle bars, steel	15.25 to	15.75
Cast iron carwheels...	12.25 to	12.75
Railroad malleable	14.75 to	15.25
Agric. malleable	11.25 to	11.75
		Per Net Ton
Iron car axles	19.50 to	20.00
Steel car axes	19.00 to	19.50
Locomotive tires	15.25 to	15.75
Pipes and flues	9.25 to	9.75
No. 1 machinery cast.	12.25 to	12.75
Clean auto. cast.	12.25 to	12.75
No. 1 railroad cast....	11.25 to	11.75
No. 1 agric. cast.....	10.75 to	11.25
Stove plate	8.25 to	8.75
Grate bars	8.25 to	8.75
Brake shoes	9.25 to	9.75

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$15.00 to	$15.50
No. 2 hvy. mltng. steel.	13.75 to	14.25
Low phos. plate	15.50 to	16.00
No. 1 busheling	13.50 to	14.00
Hydraulic bundles	14.25 to	14.75
Machine shop turn....	9.75 to	10.25

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$14.00 to	$14.50
No. 2 hvy. mltng. steel.	13.50 to	14.00
Comp. sheet steel	13.50 to	14.00
Light bund. stampings	11.00 to	11.50
Drop forge flashings..	13.00 to	13.50
Machine shop turn....	7.00 to	7.50
Short shov. turn.....	7.50 to	8.00
No. 1 busheling	13.00 to	13.50
Steel axle turnings....	11.00 to	11.50
Low phos. billet and bloom crops	18.00 to	18.50
Cast iron borings	7.75 to	8.25
Mixed bor. & turn....	7.75 to	8.25
No. 2 busheling	7.75 to	8.25
No. 1 cast	16.50 to	17.00
Railroad grate bars ..	9.50 to	10.00
Stove plate	10.00 to	10.50
Rails under 3 ft.	19.00 to	19.50
Rails for rolling	17.00 to	17.50
Railroad malleable ...	15.50 to	16.00
Cast iron carwheels ..	14.00 to	14.50

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$13.75 to	$14.25
No. 2 hvy. mltng. steel.	11.75 to	12.25
Scrap rails	15.00 to	15.50
New hvy. b'ndled sheets	11.75 to	12.25
Old hydraul. bundles..	10.75 to	11.25
Drop forge flashings...	11.75 to	12.25
No. 1 busheling	11.75 to	12.25
Hvy. axle turnings....	10.50 to	11.00
Machine shop turn....	6.75 to	7.25
Knuckles & couplers..	16.50 to	17.00
Coil & leaf springs....	16.50 to	17.00
Rolled steel wheels....	16.00 to	16.50
Low phos. billet crops.	15.50 to	16.00
Shov. turnings	8.75 to	9.25
Mixed bor. & turn.....	7.50 to	8.00
Cast iron borings	7.50 to	8.00
Steel car axles	16.50 to	17.00
No. 1 machinery cast..	15.50 to	16.00
No. 1 cupola cast.	14.50 to	15.00
Stove plate	13.00 to	13.50
Steel rails under 3 ft..	18.00 to	18.50
Cast iron carwheels...	13.50 to	14.00
Railroad malleable	15.00 to	15.50
Chemical borings	9.00 to	9.50

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting.	$13.25 to	$13.75
No. 1 hvy. melting....	13.00 to	13.50
No. 2 hvy. melting....	12.00 to	12.50
No. 1 locomotive tires.	13.50 to	14.00
Misc. stand. sec. rails.	14.50 to	15.00
Railroad springs	15.50 to	16.00
Bundled sheets	7.50 to	8.00
No. 1 busheling	7.50 to	8.00
Cast. bor. & turn.....	3.50 to	4.00
Machine shop turn....	3.50 to	4.00
Heavy turnings	9.50 to	10.00
Rails for rolling.....	17.50 to	18.00
Steel car axles	18.50 to	19.00
No. 1 RR. wrought....	10.50 to	11.00
No. 2 RR. wrought....	12.50 to	13.00
Steel rails under 3 ft..	16.25 to	16.75
Steel angle bars	14.50 to	15.00
Cast iron carwheels...	14.00 to	14.50
No. 1 machinery cast..	15.00 to	15.50
Railroad malleable ...	12.00 to	12.50
No. 1 railroad cast....	12.75 to	13.00
Stove plate	9.00 to	9.50
Grate bars	9.00 to	9.50
Brake shoes	10.75 to	11.25

CINCINNATI

Dealers' buying prices per gross ton at yards:

No. 1 hvy. mltng. steel.	$11.50 to	$12.00
No. 2 hvy. mltng. steel.	9.25 to	9.75
Scrap rails for mltng.	15.25 to	15.75
Loose sheet clippings.	6.75 to	7.25
Hydrau. b'ndled sheets	11.00 to	11.50
Cast iron borings	3.50 to	4.00
Machine shop turn....	5.25 to	5.75
No. 1 busheling	8.00 to	8.50
No. 2 busheling	2.75 to	3.25
Rails for rolling	17.50 to	18.00
No. 1 locomotive tires.	14.25 to	14.75
Short rails	18.00 to	18.50
Cast iron carwheels...	12.75 to	13.25
No. 1 machinery cast.	13.50 to	14.00
No. 1 railroad cast....	12.75 to	13.25
Burnt cast	6.75 to	7.25
Stove plate	6.75 to	7.25
Agricul. malleable	11.75 to	12.25
Railroad malleable	14.25 to	14.75
Mixed hvy. cast.....	10.50 to	11.00

BIRMINGHAM

Per gross ton delivered to consumer:

Hvy. melting steel....	$12.50 to	$14.00
Scrap steel rails	14.50 to	15.00
Short shov. turnings..	7.50 to	8.10
Stove plate	9.00 to	10.00
Steel axles	15.00 to	16.00
Iron axles	15.00 to	16.00
No. 1 RR. wrought	....	10.00
Rails for rolling	16.00 to	16.50
No. 1 cast.	....	14.50
Tramcar wheels	....	14.00

DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. industrial steel	$10.50 to	$11.00
No. 2 hvy. mltng. steel.	9.50 to	10.00
Borings and turnings.	5.75 to	6.25
Long turnings	5.50 to	6.00
Short shov. turnings..	6.00 to	6.50
No. 1 machinery cast..	12.25 to	12.75
Automotive cast	13.50 to	14.00
Hvy. breakable cast...	9.75 to	10.25
Hydraul. comp. sheets.	11.75 to	12.25
Stove plate	8.00 to	8.50
New factory bushel...	10.75 to	11.25
Sheet clippings	8.25 to	9.25
Flashings	9.50 to	10.00
Low phos. plate scrap	12.00 to	12.50

NEW YORK

Dealers' buying prices per gross ton on cars:

No. 1 hvy. mltng. steel.	$10.50 to	$11.00
No. 2 hvy. mltng. steel.	9.00 to	9.50
Hvy. breakable cast...	11.50 to	12.00
No. 1 machinery cast.	11.50 to	12.00
No. 2 cast	9.50 to	10.00
Stove plate	9.50 to	10.00
Steel car axles	20.00 to	20.50
Shafting	15.50 to	16.00
No. 1 RR. wrought....	11.00 to	11.50
No. 1 wrought long....	9.50 to	10.00
Spec. iron & steel pipe	9.00 to	9.50
Rails for rolling	16.00 to	16.50
Clean steel turnings*..	4.00 to	4.50
Cast borings*	3.50 to	4.00
No. 1 blast furnace...	3.50 to	4.00
Cast borings (chem.)..	9.50 to	10.00
Unprepared yard scrap	6.00 to	6.50
Light iron	3.00 to	3.50
Per gross ton, delivered local foundries:		
No. 1 machn. cast†....	$13.50 to	$14.00
No. 2 cast†	10.50 to	11.00

* $1.50 less for truck loads.
† Northern N. J. prices are $2 to $2.50 higher.

BOSTON

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.....	Nominal	
Scrap rails	Nominal	
No. 2 steel	Nominal	
Breakable cast	$10.50 to	$10.60
Machine shop turn....	....	3.38
Mixed bor. & turn.....	2.00 to	2.25
Bun. skeleton long....	....	8.15
Shafting	15.50 to	15.65
Cast bor. chemical....	5.50 to	5.75
Per gross ton delivered consumers' yards:		
Textile cast	$13.50 to	$15.00
No. 1 machine cast....	13.50 to	15.00

PACIFIC COAST

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$12.50 to	$14.00
No. 2 hvy. mltng. steel.	11.50 to	13.00

CANADA

Dealers' buying prices at their yards, per gross ton:

	Toronto	Montreal
No. 1 hvy. mltng. steel.	$9.50	$9.00
No. 2 hvy. mltng. steel.	8.00	7.50
Mixed dealers steel....	7.00	6.50
Scrap pipe	5.50	5.00
Steel turnings	4.50	4.00
Cast borings	3.50	3.00
Machinery cast	15.00	14.00
Dealers cast	13.00	12.00
Stove plate	11.00	10.50

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered, barges		
No. 1 hvy. mltng. steel.	$12.00 to	$12.50
No. 2 hvy. mltng. steel.	10.50 to	11.00
No. 2 cast	....	11.00
Stove plate	....	10.00
Boston on cars at Army Base or Mystic Wharf		
No. 1 hvy. mltng. steel.	$13.50 to	$14.00
No. 2 hvy. mltng. steel.	12.50 to	13.00
Rails (scrap)	....	14.00
Philadelphia, delivered alongside boats, Port Richmond		
No. 1 hvy. mltng. steel.	$14.50 to	$15.00
No. 2 hvy. mltng. steel.	13.50 to	14.00

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

(Prices are f.o.b. unless otherwise indicated)

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (Rerolling only). Prices delivered Detroit are $2 higher. F.o.b. Duluth, billets only, $2 higher.

	Per Gross Ton
Rerolling	$34.00
Forging quality	40.00

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open hearth or bessemer	$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	1.90c.

Wire Rods

(No. 5 to 9/32 in.)

	Per Gross Ton
Pittsburgh, Chicago or Cleveland	$43.00
Worcester, Mass.	45.00
Birmingham	43.00
San Francisco	52.00

Rods over 9/32 in. or 47/64 in., inclusive, $5 a ton over base.

SOFT STEEL BARS

	Base per Lb.
Pittsburgh, Chicago, Gary, Cleveland, Buffalo and Birmingham	2.25c.
Detroit, delivered	2.35c.
Duluth	2.35c.
Philadelphia, delivered	2.57c.
New York	2.59c.
On cars dock Gulf ports	2.60c.
On cars dock Pacific ports	2.85c.

RAIL STEEL BARS

(For merchant trade)

Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham	2.10c.
On cars dock Tex. Gulf ports	2.45c.
On cars dock Pacific ports	2.70c.

BILLET STEEL REINFORCING BARS

(Straight lengths as quoted by distributers)

Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Cleveland, Youngstown or Sparrows Pt.	1.90c. to 2.05c.
Detroit, delivered	2.00c. to 2.15c.
On cars dock Tex. Gulf ports	2.25c. to 2.40c.
On cars dock Pacific ports	2.50c.

RAIL STEEL REINFORCING BARS

(Straight lengths as quoted by distributers)

Pittsburgh, Chicago, Gary, Buffalo, Cleveland, Youngstown or Birmingham	1.75c. to 1.90c.
Detroit, delivered	1.85c. to 2.00c.
On cars dock Tex. Gulf ports	2.10c. to 2.25c.
On cars dock Pacific ports	2.35c.

Prices on reinforcing bars have been subject to concessions of $3 a ton or more from above quotations.

IRON BARS

Chicago and Terre Haute	2.15c.
Pittsburgh (refined)	3.60c.

COLD FINISHED BARS AND SHAFTING*

	Base per Lb.
Pittsburgh, Buffalo, Cleveland, Chicago and Gary	2.70c.
Detroit	2.75c.

* In quantities of 10,000 to 19,999 lb.

PLATES

	Base per Lb.
Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont, Del.	2.10c.
Philadelphia, del'd	2.15c.
New York, del'd	2.29c.
On cars dock Gulf ports	2.45c.
On cars dock Pacific ports	2.60c.
Wrought iron plates, P't'g	3.80c.

FLOOR PLATES

Pittsburgh or Chicago	3.35c.
New York, del'd	3.71c.
On cars dock Gulf ports	3.70c.
On cars dock Pacific ports	3.95c.

STRUCTURAL SHAPES

	Base per Lb.
Pittsburgh, Chicago, Gary, Buffalo, Bethlehem or Birmingham	2.10c.
Philadelphia, del'd	2.215c.
New York, del'd	2.27c.
On cars dock Gulf ports	2.45c.
On cars dock Pacific ports	2.70c.

STEEL SHEET PILING

	Base per Lb.
Pittsburgh, Chicago or Buffalo	2.40c.
On cars dock Gulf ports	.285c.
On cars dock Pacific ports	2.90c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton	$40.00
Angle bars, per 100 lb.	2.70

F.o.b. Basing Points

Light rails (from billets) per gross ton	$40.60
Light rails (from rail steel) per gross ton	39.00

	Base per Lb.
Cut spikes	3.00c.
Screw spikes	4.55c.
Tie plates, steel	2.15c.
Tie plates, Pacific Coast ports	2.25c.
Track bolts, to steam railroads	4.15c.
Track bolts to jobbers, all sizes (per 100 counts)	65-5

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS

Hot Rolled

	Base per Lb.
Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown or Chicago	2.15c.
Detroit, delivered	2.25c.
Philadelphia, delivered	2.32c.
Granite City	2.25c.
On cars dock Pacific ports	2.65c.
Wrought iron, Pittsburgh	4.25c.

Cold Rolled*

Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown or Chicago	3.20c.
Detroit, delivered	3.30c.
Granite City	3.30c.
Philadelphia, delivered	3.52c.
On cars dock Pacific ports	3.80c.

* Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base.

Galvanized Sheets, 24 Gage

Pittsburgh, Chicago, Gary, Sparrows Point, Buffalo, Middletown, Youngstown or Birmingham	3.50c.
Philadelphia, delv'd	3.67c.
Granite City	3.60c.
On cars dock Pacific ports	4.00c.
Wrought iron Pittsburgh	6.10c.

Electrical Sheets

(*F.o.b. Pittsburgh*)

	Base per Lb.
Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
Special Motor	4.95c.
Special Dynamo	5.65c.
Transformer	6.15c.
Transformer Special	7.15c.
Transformer Extra Special	7.65c.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extra plus 25c. per 100 lb. for coils. Pacific ports add 70c. a 100 lb.

Long Ternes

No. 24 unassorted 8-lb. coating f.o.b. Pittsburgh or Gary	3.95c.
F.o.b. cars dock Pacific ports	4.65c.

Vitreous Enameling Stock, 20 Gage*

Pittsburgh, Chicago, Gary, Youngstown, Middletown or Cleveland	3.35c.
Detroit, delv'd	3.45c.
Granite City	3.45c.
On cars dock Pacific ports	3.95c.

TIN MILL PRODUCTS

*Tin Plate

	Per Base Box
Standard cokes, Pittsburgh, Chicago and Gary	$5.00
Standard cokes, Granite City	5.10

* Prices effective Nov. 10 on shipments through first quarter of 1939.

Special Coated Manufacturing Ternes

	Per Base Box
Granite City	$4.40
Pittsburgh or Gary	4.30

Roofing Terne Plate

(*F.o.b. Pittsburgh*)

(Per Package, 112 sheets, 20 x 28 in.)

8-lb. coating I.C.	$12.00
15-lb. coating I.C.	14.00
20-lb. coating I.C.	15.90
25-lb. coating I.C.	16.00
30-lb. coating I.C.	17.25
40-lb. coating I.C.	19.50

Black Plate, 29 gage and lighter

Pittsburgh, Chicago and Gary	3.05c.
Granite City	3.15c.
On cars dock Pacific ports, boxed	4.00c.

HOT ROLLED STRIP

(*Widths up to 12 in.*)

	Base per Lb.
Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown or Birmingham	2.15c.
Detroit, delivered	2.25c.

Cooperage Stock

Pittsburgh & Chicago	2.25c.

COLD ROLLED STRIP*

	Base per Lb.
Pittsburgh, Youngstown or Cleveland	2.95c.
Chicago	3.05c.
Detroit, delivered	3.05c.
Worcester	3.15c.

* Carbon 0.25 and less.

Commodity Cold Rolled Strip

Pittsburgh, Youngstown, or Cleveland	3.10c
Detroit, delivered	3.20c.
Worcester	3.50c.

COLD ROLLED SPRING STEEL

		Pittsburgh and Cleveland	Worcester
Carbon	0.26-0.50%	2.95c.	3.15c.
Carbon	.51 .75	4.30c.	4.50c.
Carbon	.76-1.00	6.15c.	6.35c.
Carbon	1.01 to 1.25	8.35c.	8.55c.

WIRE PRODUCTS

Carload lots, f.o.b. Pittsburgh, Chicago, Cleveland and Birmingham)

To Manufacturing Trade

	Per Lb.
Bright wire	2.60c.
Galvanized wire, base	2.65c.*
Spring wire	3.20c.

* On galvanizing wire to manufacturing trade, size and galvanizing extras are charged, the price Nos. 6 to 9 gage, inclusive, thus being 3.15c.

To the Trade

	Base per Keg
Standard wire nails	$2.45
Coated nails	2.45
Cut nails, carloads	3.60

	Base per 100 Lb.
Annealed fence wire	$2.95
Galvanized fence wire	3.35
Polished staples	3.15
Galvanized staples	3.40
Twisted barbless wire	3.20
Woven wire fence, base column.	67
Single loop bale ties, base col...	56
Stand. 2 pt., 12.5 gage barbed cattle wire, per 80 rod spool..	$2.54

Note: Birmingham base same on above items, except spring wire.

Add $4 a ton for Mobile, Ala.; $5 for New Orleans; $6 for Lake Charles to above bases, except on galvanized and annealed merchant fence wire, which are $1 a ton additional in each case.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel In.	Black	Galv.	*Wrought Iron* In.	Black	Galv.
⅛	56	36	⅛ & ¼	+9	+30
¼ to ⅜	59	43½	½	24	6½
½	63½	54	¾	30	13
¾	66½	58	1 & 1¼	34	19
1 to 3	68½	60½	1½	38	21½
			2	37½	21

Lap Weld

2	61	52½	2	30½	15
2½ & 3	64	55½	2½ to 3½	31½	17½
3½ to 6.66		57½	4	33½	21
7 & 8	65	55½	4½ to 8.32	½	20
9 & 10	64½	55	9 to 12	28½	15
11 & 12	63½	54			

Butt weld, extra strong, plain ends

⅛	54½	41½	¼ & ⅜	+10	+43
½ to ⅞	56½	45½	½	25	9
½	61½	53½	¾	31	15
¾	65½	57½	1 to 2	38	22½
1 to 3	67	60			

Lap weld, extra strong, plain ends

2	59	51½	2	33½	18½
2½ & 3	63	55½	2½ to 4.39	½	25½
3½ to 6.66	½	59	4½ to 6.37	½	24
7 & 8	65½	56	7 & 8	38½	24½
9 & 10	64½	55	9 to 12	32	20½
11 & 12	63½	54			

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or $4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or $2 a ton higher, on all butt weld 8 in. and smaller.

Boiler Tubes

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes. Minimum Wall.

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

	Seamless Cold Drawn	Seamless Hot Rolled	Lap Weld Hot Rolled
1 in. o.d. 13 B.W.G.	$ 9.01	$ 7.82	....
1¼ in. o.d. 13 B.W.G.	10.67	9.26	....
1½ in. o.d. 13 B.W.G.	11.79	10.23	$9.72
1¾ in. o.d. 13 B.W.G.	13.42	11.64	11.06
2 in. o.d. 13 B.W.G.	15.03	13.04	12.38
2¼ in. o.d. 13 B.W.G.	16.76	14.54	13.79
2½ in. o.d. 12 B.W.G.	18.45	16.01	15.16
2¾ in. o.d. 12 B.W.G.	20.21	17.54	16.58
3 in. o.d. 12 B.W.G.	21.42	18.59	17.54
3½ in. o.d. 12 B.W.G.	22.48	19.50	18.35
3½ in. o.d. 11 B.W.G.	28.37	24.62	23.15
4 in. o.d. 10 B.W.G.	35.20	30.54	28.66
4½ in. o.d. 10 B.W.G.	43.04	37.35	35.22
5 in o.d. 9 B.W.G	54.01	46.87	44.25
6 in. o.d. 7 B.W.G.	82.93	71.96	68.14

Extras for less carload quantities:

40,000 lb. or ft. over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

CAST IRON WATER PIPE

	Per Net Ton
*6-in. and larger, del'd Chicago.	$51.00
6-in. and larger, del d New York	49.00
*6-in. and larger, Birmingham.	43.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles....	52.00
F.o.b. dock, Seattle	52.00
4-in. f.o.b. dock, San Francisco or Los Angeles	55.00
F.o.b. dock, Seattle	52.00

Class "A" and gas pipe, $3 extra 4-in. pipe is $3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $42, Birmingham, and $50 delivered Chicago and 4-in. pipe, $45, Birmingham, and $54 delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and carriage bolts: ½ in. & 6 in. and smaller.	65, 5 and 5*
Larger and longer up to 1 in.	60, 10 and 5*
1¼ in. and larger	60, 5 and 5*
Lag bolts	60, 10 and 5
Plow bolts, Nos. 1, 2, 3 and 7	65, 5 and 5
Hot pressed nuts, and c.p.c. and t nuts, square or hex. blank or tapped: ½ in. and smaller	65 and 5
9/16 in. to 1 in. inclusive.	60, 5 and 5
1⅛ in. and larger	60 and 5

* Less carload lots and less than full container quantity. Less carload lots in full container quantity, an additional 10 per cent discount; carload lots and full container quantity, still another 5 per cent discount.

Semi-fin. hexagon nuts U.S.S. S.A.E.		
½ in. and smaller	65-5	70
9/16 to 1 in.	60-10	65
1⅛ in. and larger	60-5	60-5

In full container lots, 10 per cent additional discount.

Stove bolts in packages, nuts attached	75
Stove bolts in packages, with nuts separate	75 and 12½
Stove bolts in bulk	85

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(½-in. and larger)

Base per 100 Lb.

F.o.b. Pittsburgh, Cleveland Chicago, Birmingham $3.40

Small Rivets

(7/16-in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham .... 65 and 10

Cap and Set Screws

(Freight allowed to destination)

Per Cent Off List

Milled hexagon head, cap screws, 1 in. dia. and smaller	50 and 10
Milled square head set screws, case hardened, 1 in. dia. and smaller	75 and 10
Milled headless set screws, cut thread ¾ in. and smaller.	68 and 10
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller	65 and 10
Upset set screws, cup and oval points	73 and 10
Milled studs	57 and 10

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem. Base price, $56.00 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade, base	2.80c.
Delivered, Detroit	2.90c.

S.A.E. Series Numbers	Alloy Differential per 100 Lb.
200 (½% Nickel)	$0.35
2100 (1½% Nickel)	$0.75
2300 (3½% Nickel)	1.55
2500 (5% Nickel)	2.25
3100 Nickel-chromium	0.70
3200 Nickel-chromium	1.85
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum)	0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum)	0.75
4600 Nickel - molybdenum (0.20 to 0.30 Mo. 1.50 to 2.00 Ni.)	1.10
5100 Chrome steel (0.60-0.90 Cr.)	0.35
5100 Chrome steel (0.80-1.10 Cr.)	0.45
5100 Chromium spring steel	0.15
6100 Chromium-vanadium bar	1.20
6100 Chromium-vanadium spring steel	0.85
Chromium-nickel vanadium	1.50
Carbon-vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.40c. base per lb. Delivered Detroit, 3.50c., carlots.

CORROSION & HEAT RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chrome-Nickel

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25c.	24c.
Plates	29c.	27c.
Structural shapes.	25c.	24c.
Sheets	36c.	34c.
Hot-rolled strip	23.50c.	21.50c.
Cold-rolled strip	30c.	28c.
Drawn wire	25c.	24c.

Straight Chrome

	No. 410	No. 430	No. 442	No. 446
Bars	18.50c.	19c.	22.50c.	27.50c.
Plates	21.50c.	22c.	25.50c.	30.50c.
Sheets	26.50c.	29c.	32.50c.	36.50c.
Hot Strip	17c.	17.50c.	23c.	28c.
Cold stp.	22c.	22.50c.	28.50c.	36.50c.

TOOL STEEL

High speed	67c.
High-carbon-chrome	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher

British and Continental

BRITISH

Per Gross Ton
f.o.b. United Kingdom Ports

Ferromanganese, export	Nominal
Tin plate, per base box	20s. 3d.
Steel bars, open hearth.	£10 8s.
Beams, open-hearth	£10
Channels, open-hearth	£10 5s.
Angles, open-hearth	£10
Black sheets, No. 24 gage.	£13
Galvanized sheets, No. 24 gage	£15 15s.

CONTINENTAL

Per Gross Ton, Gold £.
f.o.b. Continental Ports

Billets, Thomas	Nominal
Wire rods, No. 5 B.W.G.	£5 10s.
Steel bars, merchant	£5 5s.
Sheet bars	Nominal
Plate ¼ in. and up	£5 7s.
Plate 3/16 in. and 5 mm.	£5 13s.
Sheet ⅛ in.	£5 9s. 6d.
Beams, Thomas	£4 18s.
Angles (Basic)	£4 18s.
Hoops and strip, base	£5 12s.

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	$22.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	$22.00
Delivered Brooklyn	24.50
Delivered Newark or Jersey City	23.53
Delivered Philadelphia	22.84
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago, Granite City, Cleveland and Youngstown	21.00
F.o.b. Buffalo	21.00
F.o.b. Detroit	21.00
Southern, delivered Cincinnati	21.06
Northern, delivered, Cincinnati	21.44
F.o.b. Duluth	21.50
F.o.b. Provo, Utah	19.00
Delivered, San Francisco, Los Angeles or Seattle	24.50
F.o.b. Birmingham*	17.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 0.70 per cent and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same, except at Birmingham and Provo, which are not malleable iron basing points.

Basic

F.o.b. Everett, Mass.	$22.25
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	21.50
F.o.b. Buffalo	20.00
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago, Granite City, Cleveland and Youngstown	20.50
Delivered Philadelphia	22.34
Delivered Canton, Ohio	21.89
Delivered Mansfield, Ohio	22.44
F.o.b. Birmingham	16.00

Bessemer

F.o.b. Buffalo	$22.00
F.o.b. Everett, Mass.	23.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	23.00
Delivered Newark or Jersey City	24.53
Erie, Pa., and Duluth	22.00
F.o.b. Neville Island, Toledo, Chicago and Youngstown	21.50
F.o.b. Birmingham	22.00
Delivered Cincinnati	22.11
Delivered Canton, Ohio	22.89
Delivered Mansfield, Ohio	23.44

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	$26.50

Gray Forge

Valley or Pittsburgh furnace	$20.50

Charcoal

Lake Superior furnace	$25.00
Delivered Chicago	28.34

Canadian Pig Iron

Per Gross Ton

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$26.50
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	25.50

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$27.50
No. 2 fdy., sil. 1.75 to 2.25	27.00
Malleable	27.50
Basic	27.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload) $80.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%	$28.00
Domestic, 26 to 28%	33.00

Electric Ferrosilicon

Per Gross Ton Delivered; Lump Size

50% (carload lots, bulk)	$69.50*
50% (ton lots in 50 gal. bbl.)	80.50*
75% (carload lots, bulk)	126.00*
75% (ton lots in 50 gal. bbl.)	139.00*

Bessemer Ferrosilicon

F.o.b. Furnace, Jackson, Ohio

Per Gross Ton

10.00 to 10.50% $30.50

For each additional 0.50% silicon up to 12%, 50c. per ton is added. Above 12% add 75c. per ton.

For each unit of manganese over 2%, $1 per ton additional. Phosphorus 0.75% or over, $1 per ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 5.00 to 5.50% $24.50

For each additional 0.5% silicon up to 12%, 50c. a ton is added. Above 12% add 75c. a ton.

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Ferrochrome

Per Lb. Contained Cr., Delivered Carlots, Lump Size, on Contract

4 to 6% carbon	10.50c.*
2% carbon	16.50c.*
1% carbon	17.50c.*
0.10% carbon	19.50c.*
0.06% carbon	20.00c.*

Silico-manganese

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract

3% carbon	$83.00
2.50% carbon	88.00
2% carbon	93.00
1% carbon	103.00

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads	$1.75
Ferrotungsten, 100 lbs. and less	2.00
Ferrovanadium, contract, per lb. contained V., delivered	$2.70 to $2.90†
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., tons lots.	$2.25†
Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	$142.50
Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	$157.50
Ferrophosphorus, electric or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with $3 unitage, freight equalized with Rockdale, Tenn., per gross ton	$58.50
Ferrophosphorus, electrolytic, 23-26% in car lots, f.o.b. Monsanto (Siglo), Tenn., 24%, per gross ton, $3 unitage, freight equalized with Nashville	$75.00
Ferromolybdenum, per lb. Mo. f.o.b. furnace	95c.
Calcium molybdate, per lb. Mo. f.o.b. furnace	80c.

*Spot prices are $5 per ton higher
†Spot prices are 10c. per lb. of contained element higher.

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton

Old range, Bessemer, 51.50%	$5.25
Old range, non-Bessemer, 51.50%	5.10
Messabi, Bessemer, 51.50%	5.10
Messabi, non-Bessemer, 51.50%	4.95
High phosphorus, 51.50%	4.85

Foreign Ore

C.i.f. Philadelphia or Baltimore

Per Unit

Iron, low phos., copper free, 55 to 58% dry, Algeria	12c.
Iron, low phos., Swedish, average, 68½% iron	12c.
Iron, basic or foundry, Swedish, aver. 65% iron	11c.
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed 52%	31c.
Man., African, Indian, 44-48%	29c.
Man., African, Indian, 49-51%	31c.
Man., Brazilian, 46 to 48½%	28c.

Per Short Ton Unit

Tungsten, Chinese, Wolframite, duty paid, delivered	$19.50
Tungsten, domestic, scheelite delivered	$18.00 to $19.00
Chrome ore (lump) c.i.f. Atlantic Seaboard, per gross ton: South African (low grade)	$15.00
Rhodesian, 45%	19.00
Rhodesian, 48%	23.00
Turkish, 48-49%	23.00
Turkish, 45-46%	19.00
Turkish, 40-44%	16.00
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton: 50%	$24.00
48-49%	22.50

FLUORSPAR

Per Net Ton

Domestic washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	$17.00 to $18.00
Domestic, f.o.b. Ohio River landing barges	18.00
No. 2 lump, 85-5, f.o.b. Kentucky and Ill. mines	18.00
Foreign, 85% calcium, fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	24.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	31.50

FUEL OIL

Per Gal.

No. 2, f.o.b., Bayonne	4.25c.
No. 6, f.o.b., Bayonne	2.26c.
No. 5 Bur. Stds., del'd Chicago.	3.25c.
No. 6 Bur. Stds., del'd Chicago.	2.75c.
No. 3 distillate, del'd Cleve'd	5.50c.
No. 4 industrial, del'd Cleve'd	5.25c.
No. 5 industrial, del'd Cleve'd	3.00c.
No. 6 industrial, del'd Cleve'd	2.75c.

COKE

Per Net Ton

Furnace, f.o.b. Connellsville, Prompt	$3.75
Foundry, f.o.b. Connellsville, Prompt	$4.75 to 5.50
Foundry, by-product, Chicago ovens	10.25
Foundry, by-product, del'd New England	12.50
Foundry, by-product, del'd Newark or Jersey City	10.88 to 11.40
Foundry, by-product, Philadelphia	10.95
Foundry, by-product, delivered Cleveland	10.30
Foundry, by-product, delivered Cincinnati	9.75
Foundry, Birmingham	7.50
Foundry, by-product, del'd St. Louis industrial district	10.75 to 11.00
Foundry, from Birmingham, f.o.b. cars dock Pacific ports	14.75

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH

	Base per Lb.
Plates	3.55c.
Shapes	3.55c.
Soft steel bars and small shapes	3.60c.
**Reinforcing steel bars	2.70c.
Cold finished bars and screw stock	3.95c.
Hot rolled strip	3.75c.
Hot rolled sheets	3.50c.
Galv. sheets (24 ga.) 500 lb. to 1499 lb.	4.50c.
Wire, black, soft annealed	3.15c.
Wire, galv., soft	3.55c.
Track spikes (1 to 24 kegs)	3.75c.
Wire nails (in 100-lb. kegs)	2.65c.

On plates, structurals, bars, strip and hot rolled sheets, base applied to orders of 400 to 1999 lb.
** On reinforcing bars base applies to orders of less than one ton and includes switching and carting charge.
All above prices for delivery within the Pittsburgh switching district.

NEW YORK

	Base per Lb.
Plates, ¼ in. and heavier	3.83c.
Structural shapes	3.75c.
Soft steel bars, round	3.94c.
Iron bars, Swed. charcoal	7.50 to 8.25c
Cold-fin, shafting and screw stock:	
Rounds, squares, hexagons	4.39c.
Flats up to 12 in. wide	4.39c.
Cold-rolled strip, soft and quarter hard	3.66c.
Hot-rolled strip, soft O.H.	4.11c.
Hot-rolled sheets (10 ga.)	3.73c.
Galv. sheets (24 ga.)	4.60 to 4.85c.
Long ternes (24 ga.)	5.50 to 6.20c.
Cold-rolled sheets (20 ga.)	
Standard quality	4.90c.
Deep drawing	5.15c.
Stretcher leveled	5.50c.
SAE, 2300, hot-rolled	7.50c.
SAE, 3100, hot-rolled	6.10c.
SAE, 6100, hot-rolled annealed	10.25c.
SAE, 2300, cold-rolled	8.69c.
SAE, 3100, cold-rolled, annealed	7.29c.
Floor plate, ⅛ in. and heavier	5.43c.
Standard tool steel	12.50c.
Wire, black, annealed (No. 9)	4.65c.
Wire, galv. (No. 9)	5.00c.
Open-hearth spring steel	4.75c. to 10.25c.
Common wire nails, per keg in 25 keg lots	$3.25

CHICAGO

	Base per Lb.
Plates and structural shapes	3.55c.
Soft steel bars, rounds and angles	3.60c.
Soft steel squares, hexagons, channels and Tees	**3.75c.**
Hot rolled strip	3.75c.
Floor plates	5.15c.
Hot rolled sheets	3.50c.
Galvanized sheets	4.50c.
Cold rolled sheets	4.45c.
Cold finished carbon bars	4.05c.

Above prices are subject to deductions and extras for quantity and are f.o.b. consumer's plant within Chicago free delivery zone.

CLEVELAND

	Base per Lb.
Plates	3.55c.
Structural shapes	3.73c.
Soft steel bars	3.50c.
Reinfor. bars (under 2000 lb.)†	2.55c.
Cold-fin. bars (1000 lb., over).	4.05c.
Hot-rolled strip	3.65c.
Cold rolled sheets	4.70c.
Cold-finished strip	3.35c.
Galvanized sheets (No. 24)	4.62c.
Hot-rolled sheets	3.50c.
Floor plates, 3/16 in. and heavier	5.33c.
*Black ann'l'd wire, per 100 lb.	$3.10
*No. 9 galv. wire, per 100 lb.	3.50
*Com. wire nails, base per keg	2.60
Hot rolled alloy steel (3100)	6.05c.
Cold rolled alloy steel (3115)	6.85c.

* For 5000 lb. or less.
† 500 lb. base quantity.

Prices shown on hot rolled bars, strip, sheets, shapes and plates are for 400 to 1999 lb. Alloy steel, 1000 lb. and over; galvanized sheets, 150 to 1499 lb.; cold rolled sheets, 399 lb. and under.

ST. LOUIS

	Base per Lb.
Plates and structural shapes	3.82c.
Bars, soft steel (rounds and flats)	3.87c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	4.02c.
Cold fin. rounds, shafting, screw stock	4.32c.
Galv. sheets (24 ga.)	4.77c.
Hot rolled sheets	3.77c.
Galv. corrugated sheets, 24 ga. and heavier*	4.82c.
Structural rivets	5.92c.

* No. 26 and lighter take special prices.

BOSTON

	Base per Lb.
Structural shapes, 3 in. and larger	5.85c.
Plates, ¼ in. and heavier	3.85c.
Bars	3.98c.
Heavy hot rolled sheets	3.86c.
Hot rolled sheets	4.21c.
Hot rolled annealed sheets	4.76c.
Galvanized sheets	4.76c.
Cold rolled sheets	4.93c.

The following quantity differentials apply: Less than 100 lb., plus $1.50 per 100 lb.; 100 to 399 lb. plus 50c.; 400 to 1999 lb. base; 2000 to 9999 lb. minus 20c.; 10,000 to 39,999 lb. minus 30c.; 40,000 lb. and over minus 40c.

BUFFALO

Plates	3.77c.
Floor plates	5.40c.
Struc. shapes	3.55c.
Soft steel bars	3.60c.
Reinforcing bars (20,000 lb. or more)	2.05c.
Cold-fin. flats, squares, rounds, and hex.	4.05c.
Hot-rolled sheets, 3/16 x 14 in. to 48 in. wide incl. also sizes No. 8 to 30 ga.	3.50c.
Galv. sheets (24 ga.)	4.50c.
Bands and hoops	3.97c.

NEW ORLEANS

	Base per Lb.
Mild steel bars	4.20c.
Reinforcing bars	3.24c.
Structural shapes	4.10c.
Plates	4.10c.
Hot-rolled sheets, No. 10	4.35c.
Steel bands	4.75c.
Cold-finished steel bars	5.10c.
Structural rivets	4.85c.
Boiler rivets	4.85c.
Common wire nails, base per keg	3.55
Bolts and nuts, per cent off list	60

REFRACTORIES PRICES

Fire Clay Brick

	Per 1000 f.o.b. Works
Super-duty brick, at St. Louis	$60.80
First quality Pennsylvania, Maryland, Kentucky, Missouri and Illinois	47.50
First quality, New Jersey	52.50
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	42.75
Second quality, New Jersey	49.00
No. 1, Ohio	39.90
Ground fire clay, per ton	7.10

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$40.00
Chicago District	49.00
Birmingham	40.00
Silica cement per net ton (Eastern)	8.55

Chrome Brick

	Net per Ton
Standard f.o.b. Baltimore, Plymouth Meeting and Chester	$47.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	47.00

Magnesite Brick

	Net per Ton
Standard f.o.b. Baltimore and Chester	$67.00
Chemically bonded, f.o.b. Baltimore	57.00

Grain Magnesite

	Net per Ton
Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks	40.00
Domestic, f.o.b. Chewelah, Wash. (in bulk)	22.00

PHILADELPHIA

	Base per Lb.
*Plates, ¼-in. and heavier	3.40c.
*Structural shapes	3.40c.
*Soft steel bars, small shapes, iron bars (except bands)	3.60c.
‡Reinforc. steel bars, square and deformed	2.61c.
Cold-finished steel bars	4.36c.
*Steel hoops	4.10c.
*Steel bands, No. 12 and 3/16 in. incl.	3.60c.
*Spring steel	4.75c.
†Hot-rolled anneal. sheets	3.40c.
†Galvanized sheets (No. 24)	4.50c.
*Diam. pat. floor plates, ¼ in.	5.00c.

These prices are for delivery in Philadelphia trucking area.
*Base prices subject to deduction on orders aggregating 4000 lb. or over.
†For 25 bundles or over.
‡For one to five tons.

BIRMINGHAM

Bars and bar shapes	$3.85 base		
Structural shapes and plates	3.75	"	
Hot rolled sheets No. 10 ga.	3.80	"	
Hot rolled sheets No. 24 ga.	4.40	"	3500 lb. and over
Galvanized sheets No. 24 ga.	5.05	"	3500 lb. or more
Strip	4.05	"	
Reinforcing bars.	3.85	"	
Floor plates	5.96	"	
Cold finished bars	4.91	"	
Machine and carriage bolts	.....50 & 10 off list		
Rivets (structural)	$4.60 base		

On plates, shapes, bars, hot-rolled strip heavy hot-rolled sheets, the base applies on 400 to 3999 lb. All prices are f.o.b. consumer's plant.

PACIFIC COAST

	Base per Lb.		
	San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	4.00c.	4.00c.	4.05c.
Shapes, standard	4.00c.	4.00c.	4.05c
Soft steel bars	4.05c.	4.00c.	4.30c
Reinforcing bars, f.o.b. cars dock Pacific ports	2.675c.	open.	2.975c.
Hot-rolled sheets (No. 10)	4.00c.	4.20c.	3.95c.
Galv. sheets (No. 24 and lighter)	5.15c.	5.05c.	5.25c.
Galv. sheets (No. 22 and heavier)	5.40c.	5.05c.	5.25c.
Cold-finished steel Rounds	6.55c.	6.60c.	7.10c.
Squares and hexagons	7.80c.	7.85c.	7.10c.
Flats	8.30c.	8.35c.	8.10c.
Common wire nails—base per keg less carload	$3.20	$3.05	$3.00

All items subject to differentials for quantity.

ST. PAUL

	Base per Lb.
Mild steel bars, rounds	4.10c.
Structural shapes	4.00c.
Plates	4.00c.
Cold-finished bars	4.83c.
Hot-rolled annealed sheets, No. 24	4.75c.
Galvanized sheets, No. 24	5.00c.

On mild steel bars, shapes and plates the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

MEMPHIS

	Base per Lb.
Mild steel bars	4.01c.
Shapes, bar size	4.01c.
Iron bars	4.01c.
Structural shapes	3.96c.
Plates	3.96c.
Hot-rolled sheets	3.91c.
Galvanized sheets, No. 24	5.26c.
Steel bands	4.16c.
Cold-drawn rounds	4.61c.
Cold-drawn flats, squares, hexagons	6.61c.

PLANT EXPANSION AND EQUIPMENT BUYING

NORTH ATLANTIC

Simmons Machine Tool Corp., Broadway, Albany, N. Y., will take bids soon for one-story addition to plant in Menands district, 150 x 500 ft. Cost over $100,000 with equipment.

Board of Water Supply, 346 Broadway, New York, Richard H. Burke, Jr., secretary, asks bids until Jan. 24 for bronze gate, needle and check valves; bronze foot and flap valves, bronze access doors, bronze piping, bronze elevator guides, and miscellaneous bronze and steel castings for Delaware aqueduct.

Signal Corps Procurement District, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until Jan. 24 for repair equipment (Circular 146); until Feb. 3 for jacks, binding posts, relays, terminals, etc. (Circular 132).

Mueller Steam Specialty Co., 349 West Twenty-sixth Street, New York, manufacturer of steam products, has leased about 8000 sq. ft. floor space in building at 40-14 Twenty-second Street, Long Island City, for plant.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Jan. 27 for one vertical segment wheel surface grinder (Schedule 5361), testing machine for alternating loads on assembled structures (Schedule 5372) for Brooklyn Navy Yard; 580 gas cylinders (Schedule 5339) for Brooklyn and Mare Island yards.

Board of Education, Central School District No. 1, Masonic Temple, East Greenbush, N. Y., will ask bids soon on general contract for manual training department in new two-story central school at North Greenbush. Cost about $700,000. Financing has been arranged through Federal aid. Architect for board is at 109 State Street, Albany, N. Y.

Consolidated Edison Co. of New York, Inc., 4 Irving Place, has filed plans for improvements in six-story electric generating station at 686-700 First Avenue. Cost about $35,000 exclusive of equipment.

Commanding Officer, Ordnance Department, Watervliet Arsenal, Watervliet, N. Y., asks bids until Jan. 23 for gun tube forgings (Circular 120).

Kantor Brothers, Inc., 130 Lille Street, Newark, N. J., plumbing equipment and supplies, has acquired two two-story buildings and several smaller structures at 393-403 Jelliff Avenue for new plant for storage and distribution.

State Purchase Commissioner, Room 318, State House, Trenton, N. J., asks bids until Jan. 25 for one heavy-duty cone-driven engine lathe.

Commanding Officer, Ordnance Department, Picatinny Arsenal, Dover, N. J., asks bids until Jan. 23 for one bench-type, air-operated arbor press (Circular 514); until Jan. 24, 48 forged steel demolition bomb bodies for 1000-lb. bombs (Circular 518).

Essex County Board of Vocational Education, Hall of Records, Newark, N. J., plans addition to County boys' vocational school, Irvington, forming new East wing with four vocational shops and other departments. Improvements also will be made in present structure. Cost about $460,000. A bond issue will be arranged soon. John H. and Wilson C. Ely, 744 Broad Street, Newark, are architects.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Jan. 31 for 100 electric tachometer indicators, and 100 electric tachometer generators and spare parts (Schedule 5375), 200 oxygen regulators and spare parts (Schedule 5383) for Philadelphia Navy Yard.

Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., rolling mill machinery and parts, hydraulic presses, etc., has let general contract to C. T. Painter, Reading, Pa., for extensions and improvements in foundry. Cost close to $45,000 with equipment.

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until Jan. 23 for 750 commercial brass die-castings, with alternate bids in lots of 2000 to 5000, and for one die for producing part called for (Circular 636); until Jan. 25, one shot-blasting machine for automatically cleaning interior and exterior of 5-in. shells (Circular 647).

Bellanca Aircraft Corp., Newcastle, Del., is arranging financing through sale of stock to total $742,000, of which about $60,000 will be used for purchase of new metal-working machinery for local plant, $200,000 for development of two new types of aircraft, and remainder for material purchases and other purposes.

BUFFALO DISTRICT

Air-Cooled Motors Corp., Liverpool, Onondaga County, N. Y., manufacturer of engines and parts, has let general contract to W. J. Burns Co., Heffernan Building, Syracuse, N. Y., for one-story addition. Cost close to $45,000 with equipment. Merton E. Granger, Empire Building, Syracuse, is architect.

United States Engineer Office, Federal Building, Buffalo, asks bids until Jan. 23 for brass pipe and fittings, cast iron fittings, galvanized fittings, malleable iron fittings, wrought iron pipe and similar supplies (Circular 86).

Taylor Wine Co., Rheims, near Hammondsport, N. Y., has let general contract to Werner Spitz Construction Co., 11 Comfort Street, Rochester, N. Y., for two one-story additions for storage and distribution. Cost close to $65,000 with equipment. Wiard & Martin, 315 Alexander Street, Rochester, are architects.

NEW ENGLAND

City Property Committee, Administration Building, Springfield, Mass., has let general contract to George A. Fuller Co., 11 Beacon Street, Boston, for new trade school at Blunt Park, consisting of four buildings of which two, each three stories, will be equipped for shop purposes. Cost about $1,452,800, of which $647,843 has been secured through a Federal grant. Gardner & King, 33 Lyman Street, are architects.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until Jan. 24 for one 36-in. hydraulic shaper (Circular 252), 36 group assembly back plates for machine guns (Circular 247), three motor driven small automatic milling machines (Circular 244); until Feb. 6 for machines with broaching or milling equipment (Circular 243).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Jan. 24 for propeller shaft revolution indicating equipment (Schedule 5330); until Jan. 31, eight turbine-driven main condenser circulating pumps and spare parts (Schedule 5351) for Boston, Charleston and Puget Sound Navy yards.

SOUTH ATLANTIC

Canada Dry Bottling Co., Charlotte, N. C., recently organized with capital of $150,000, has leased building at 1410 West Morehead Street, and will improve for new mechanical-bottling plant. Cost about $50,000 with equipment. Russell McKay is general manager.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Jan. 27 for two pneumatic drop hammers for naval air station, Pensacola, Fla. (Schedule 5359).

Swift & Co., Albany, Ga., are considering rebuilding part of local food products plant near city limits, recently destroyed by fire. Loss about $85,000 with equipment. Main offices are in Chicago.

WASHINGTON DIST.

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until Jan. 23 for 303 two-wheel cargo trailers, each ¾-ton capacity (Circular 398-55), locomotive parts (Circular 598-64).

LaMotte Chemical Products Co., McCormick Building, Baltimore, has let general contract to Wadsworth Brothers, Towson, Md., for two-story addition to plant at Lutherville, Md. Cost close to $40,000 with equipment. O. Eugene Adams, 329 North Charles Street, Baltimore, is architect.

General Purchasing Officer, Panama Canal, Washington, asks bids until Jan. 30 for one connecting rod-bearing boring machine, one set of cylinder hones, wrought iron buoy chain and other equipment (Schedule 3415).

Baltimore Paint & Color Works, 150 South Calverton Road, Baltimore, plans three-story addition, 17 x 135 ft. Cost over $45,000 with equipment. Abraham Finklestein, Equitable Building, is architect.

Navy Department, Washington, is arranging expenditure of about $107,000,000 for extensions and improvements in all major navy yards, to include new shipways; waterfront structures, and improvements; machine shops, forge shops, foundries and other metal-working units, with equipment; mechanical and weight-handling equipment, including cranes, hoists, trucks, etc.; power plant expansion, with new electric generating equipment, boilers and auxiliary station equipment. Fund noted is being secured through regular appropriation for public works, funds from second deficiency and about $56,000,000 from PWA and WPA. Program will be carried out by Bureau of Yards and Docks.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Jan. 24 for 66 roller path steel forgings, rough machined, and 66 steel roller paths, completely machined (Schedule 5344) for Washington yard; until Jan. 27, corrosion-resisting steel folding anchors (Schedule 5343) for Norfolk Navy Yard; two sewage pumping sets with automatic control and without receiver tanks (Schedule 5370) for naval academy, Annapolis; 35,000 sq. ft. of galvanized steel wire netting (Schedule 5368) for Sewall's Point yard; storage battery electric trucks for Eastern or Western yards (Schedule 5337).

SOUTH CENTRAL

Rheem Mfg. Co., Richmond, Cal., manufacturer of steel barrels, drums, etc., has purchased plant of Southern Steel Barrel Co., Inc., 11-15 South Liberty Street, New Orleans, and will improve for new branch plant. Additional equipment will be installed for increase in present capacity.

State Docks Commission, Mobile, Ala., plans extensions in waterfront property, including new docks, shops and storage buildings, with elevating, conveying and other mechanical equipment for handling bulk cargoes. Bond issue of $200,000 has been authorized for project.

Grocers' Baking Co., 1455 South Seventh Street, Louisville, will take bids soon on revised plans for one-story branch baking plant at West Sixth and Jefferson Streets, Lexington, Ky., with traveling ovens, conveyors and other mechanical-handling equipment. Cost about $55,000 with equipment. H. A. Churchill and Associates, Citizens' Building, Lexington, are architects.

Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn., asks bids until Jan. 24 for furnishing and erecting new or used

30,000-gal. steel storage water tank for dam construction at Gilbertsville, Ala.

Knoxville Fertilizer Co., Knoxville, Tenn., plans one-story machine shop and tool works at Maryville plant, to replace similar unit recently destroyed by fire.

SOUTHWEST

Hyde Park Breweries Association, Inc., 2110 Salisbury Street, St. Louis, has approved plans for extensions and improvements in plant, including several one and multi-story units and equipment. Cost close to $500,000 with equipment.

Canada Dry Bottling Co., Inc., St. Louis, recently organized, has leased one and two-story building at 3019-33 Olive Street, and will remodel for new mechanical-bottling works. Award for building improvements has been made to Walsh & Wells, Security Building. Cost about $50,000 with equipment. Woeter F. Cory, Orlando, Fla., is architect.

State Highway Department, State Capitol, Topeka, Kan., is considering early rebuilding of main repair and reconditioning shops for highway equipment for Fifth Division, at Hutchinson, Kan., recently destroyed by fire. Loss close to $50,000 with equipment.

Board of Public Utilities, City Hall, Kansas City, Kan., plans expansion and improvements in Quindaro pumping station for municipal water system, including new electric or steam-operated pumping machinery with daily capacity of 25,000,000 gal., and auxiliary equipment. Cost close to $500,000. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Col-Tex Refining Co., Oklahoma City, Okla., affiliated with Anderson-Prichard Oil Co., same place, has selected site at Corpus Christi, Tex., for new asphalt blending plant, with steel tank storage and distributing facilities, power house, pumping station, machine shop and other structures. Cost close to $1,200,000 with equipment.

American Liberty Oil Co., First National Bank Building, Dallas, Tex., has plans for new natural gasoline plant in oil field area at Grapeland, Tex., for production of high-test gasoline for aircraft and other service. It will include compressor plant, steel storage and distributing division, and other operating departments. Cost over $100,000 with equipment.

WESTERN PA. DIST.

Diamond Alkali Co., Koppers Building, Pittsburgh, has acquired controlling interest in Band Box Corp., 2110 Market Street, St. Louis, manufacturer of solvents, cleansers, etc., and will expand plant and install additional equipment. Company also has acquired interest in another similar plant at Philadelphia, operated by Alfred Goldsmith, and will remove to address noted at St. Louis, where production will be concentrated.

Baltimore & Ohio Railroad Co., Baltimore, and Wheeling, W. Va., has taken title to Belmont mill property of Wheeling Steel Corp., occupying three blocks on Main Street, Wheeling, for consideration of $114,000 and will develop part of property for coach and car yards, including inspection and reconditioning shop facilities.

MICHIGAN DISTRICT

Pfeiffer Brewing Co., 3700 Beaufait Avenue, Detroit, has awarded general contract to Bryant & Detwiler Co., Penobscot Building, for two-story and basement mechanical-bottling unit. Cost over $65,000 with equipment.

Detroit Sulphite Pulp & Paper Co., 9125 West Jefferson Street, Detroit, manufacturer of wrapping papers, tissue and other paper stocks, has let general contract to Jacob Hoffman Construction Co., 8866 Aurora Street, for one-story addition, 100 x 100 ft. Cost over $90,000 with equipment.

Board of Education, Saginaw, Mich., plans manual training department in new three-story high school, for which low bid has been submitted by Bryant & Detwiler Co., Penobscot Building, Detroit, at $838,990. Cost over $1,000,000 with equipment. Frantz & Spence, Saginaw, are architects.

Wilcox-Rich Division of Eaton Mfg. Co., 9771 French Road, Detroit, automobile parts and equipment, aircraft specialties, etc., is planning early installation of additional equipment in aircraft valve-manufacturing department at Battle Creek, Mich., works, to increase capacity about 75 per cent. Company manufactures a patented sodium-cooled valve unit.

OHIO AND INDIANA

Eaton Mfg. Co., 739 East 140th Street, Cleveland, automobile axles, springs, etc., has asked bids on general contract for one-story addition, 40 x 342 ft., primarily for metal stamping operations. Cost over $100,000 with equipment. George S. Rider Co., Terminal Tower Building, is architect and engineer.

Hydro Transmission Corp., Hamilton, Ohio, has been organized as a subsidiary of General Machinery Corp., with local plant, to manufacture hydraulic transmission equipment for diesel locomotives, designed to replace electrical or mechanical transmissions now used. Initial production will be carried out at plant of parent company, where facilities will be provided for parts production and assembling.

Ault & Wiborg Corp., Dana Avenue and Montgomery Road, Cincinnati, manufacturer of printing inks, etc., has let general contract to Fisher-DeVore Construction Co., 3629 Idlewild Avenue, for one and three-story addition. Cost over $75,000 with equipment.

Contracting Officer, Materiel Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until Jan. 23 for one hand-power stiff leg derrick (Circular 539), 4025 combination pliers, 900 chain pliers, 500 curved pliers, 2625 diagonal cutting pliers, and 750 flat nose pliers (Circular 548), 29 5-ton spur gear chain hoists (Circular 536), 786 6-in. flexible steel rules (Circular 541); until Jan. 24, 166 10-ton, 332 5-ton and 130 3-ton hydraulic jacks (Circular 521), 800 electrical connector plug assemblies (Circular 562), 20 engine indicators (Circular 554), 400 tail wheel axles (Circular 543), 30 hydraulic pump assemblies (Circular 531); until Jan. 25, bolts, nuts and screws (Circular 517); until Jan. 26, 24 electric-operated metal shears (Circular 551), one motor-driven internal radial aircraft cylinder grinder, with fixtures for holding cylinders (Circular 550); until Jan. 27, gun mount adapter assemblies, gun ring sight assemblies, hoist assemblies, post assemblies, etc. (Circular 532).

Board of Public Works, City Hall, Fort Wayne, Ind., has authorized extensions and improvements in municipal electric power plant to cost about $135,000. Immediate call for bids will be made for new high-pressure steam boiler unit and accessories. Bids for a mechanical stoker and other equipment will be asked latter.

MIDDLE WEST

E. M. Laird Airplane Co., 5917 South Cicero Avenue, Chicago, plans one-story unit for airplane parts production and assembling at Laporte, Ind. Cost close to $55,000 with equipment.

Board of Education, 228 North LaSalle Street, Chicago, Howard P. Savage, business manager, will take bids soon on general contract for new trade and vocational school at Chicago, Eighty-seventh and Anthony Avenues, consisting of three buildings, three stories and basement, 100 x 850 ft.; two stories and basement, 100 x 775 ft.; and one-story and basement, 100 x 575 ft. Cost about $3,500,000 with equipment. John C. Christensen, address noted, is architect.

Municipal Park Board, City Hall, Minneapolis, Christian A. Bossen, superintendent, plans two new steel hangars at municipal airport, with shop units for repair and reconditioning. Cost about $250,000 with equipment. Structures will be leased to Mid-Continent Airlines, Inc., Kansas City, Mo., and Northwest Airlines, St. Paul, Minn., respectively, which are establishing headquarters at Minneapolis.

City Council, New Hampton, Iowa, plans extensions and improvements in municipal electric power plant, including new 750-kw. diesel engine-generator unit and auxiliary equipment.

Modern Steel Equipment Co., Geneva, Ill., manufacturer of kitchen cabinets, sinks and kindred sheet steel products, has let general contract to Charles E. Giertz & Son, McBride Building, Elgin, Ill., for one-story addition, 86 x 175 ft., for storage and distribution. Cost close to $50,000 with equipment.

Mall Tool Co., 7740 South Chicago Avenue, Chicago, manufacturer of portable power tools, flexible shaft equipment, etc., has asked bids on general contract for one-story addition, 30 x 148 ft. Cost about $50,000 with equipment. Cedric A. Shantz, 140 South Dearborn Street, Chicago, is architect.

City Council, Cambridge, Minn., is considering new municipal electric light and power plant. Cost about $200,000 with equipment. It is planned to carry out financing and begin work early in spring. Ralph D. Thomas Associates, Inc., 1200 Second Avenue South, Minneapolis, is consulting engineer.

Electric Sprayit Co., and associated Moe-Bridges Co., 220-228 North Broadway, Milwaukee, have taken 17-year lease on a factory building at Sheboygan, Wis., and will gradually transfer operations following modernization of Sheboygan plant, move to be completed about Aug. 1. Electric Sprayit Co., founded at South Bend, Ind., to manufacture liquid sprayers, purchased assets of Moe-Bridges Co., manufacturing electric light fixtures, in 1934, then combining operations in Milwaukee.

Ralph J. Kraut and associates have acquired plant and business of Moloch Foundry & Machine Co., Kaukauna, Wis., and will continue operation under name of Kaukauna Machine Corp., with a capital stock of $100,000. Mr. Kraut is president of new firm.

PACIFIC COAST

Richfield Oil Corp., 555 South Flower Street, Los Angeles, plans one and multi-story addition to oil refinery at Watson, Cal., for a cold acid-treating unit. Cost about $500,000 with equipment. Company has work under way on expansion and improvements at refinery noted, including two new combination crude oil topping and cracking units for gasoline production and other structures. Steel tank storage division will be increased. This program will cost close to $5,000,000 exclusive of amount mentioned.

Los Angeles Brewing Co., 1920 North Main Street, Los Angeles, is considering expansion and improvements in plant, including one and multi-story additions and installation of equipment. Cost about $500,000 with equipment. L. A. Parker is company engineer.

Bureau of Reclamation, Denver, asks bids until Jan. 23 for one gate hoist for fish-ladder overflow gate at Roza diversion dam, Roza division, Yakima, Wash., project (Specifications 1168-D).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Jan. 24 for two tilting saw benches (Schedule 5304), one motor-driven horizontal boring, milling and drilling machine (Schedule 5305); until Jan. 27, one motor-driven press brake and one set of dies (Schedule 5329) for Puget Sound Navy Yard; four power equipments, consisting of motor-generator, controller and spare parts (Schedule 5341) for Mare Island yard; one motor-driven pattern-maker's lathe (Schedule 5333); until Jan. 31, one motor-driven metal-cutting bandsaw and six sets of carbon brushes (Schedule 5358) for San Diego Naval Air Station.

Schwartz Brothers, 3221 San Fernando Road, Los Angeles, manufacturers of plastic products, have let general contract to John T. Bibb, 143 North Brand Boulevard, Glendale, Cal., for one-story addition, 36 x 100 ft. Cost close to $40,000 with equipment.

THIS WEEK'S MACHINE ...TOOL ACTIVITIES...

. . . Current buying at fair rate . . . A number of new projects will call for machine tools . . . International Harvester should buy soon against announced program.

Fair Buying Activity in Northern Ohio

CLEVELAND—The first half of this month has been very active here, although not equal to the volume in the comparable December period. Recent sales include boring mill equipment for a down-state automotive supplier, radial drill and boring mill for an Akron machine company, and a lathe and radial drill for another Akron concern. The Cleveland School Board bought three shapers.

One of the most attractive propositions outstanding in recent months has been the prospective requirements of a Cleveland parts maker for a new steel cylinder sleeve which would be manufactured at its Detroit plant. No orders for equipment have been placed to date, but considerable engineering and investigating have been done.

New Projects at Detroit Envisage Machinery Needs

DETROIT — Scattered projects which will bear watching from the machine tool viewpoint include the new light car for which Studebaker has been making plans. Production is said to be scheduled for March. Buying has gone on quietly for some time to supply the need. Another is the proposed manufacture of cylinder sleeves in quantities by Thompson Products Co. Detroit companies are working on inquiries from Cleveland for a proposed output of 16,500 sleeves per 16-hr. day. From one of the automobile companies there has been confirmation of the fact that a new leaf spring seat cushion and back are being experimented with to replace coil spring seats. As far as is known, there have been no machine tool inquiries on this development yet. A Detroit manufacturer is introducing the seats. Prospects are seen that Kelsey-Hayes Wheel Co. will enter the field to manufacture gun carriages, although this is believed to depend upon contracts which are anticipated.

Moderate Improvement Noted at Cincinnati

CINCINNATI — Moderate improvement in the machinery demand was noted in this area the past week. With the exception of millers and grinders, the domestic demand is close to equality with foreign. In the exception, there is a fair preponderance of export business, but the domestic proportion is not diminishing. On the whole, therefore, the general aspect of demand has noticeably encouraging features and warrants market optimism. The bulk of foreign business is reported to be destined for armament purposes. Lathe demand, largely domestic, is widely scattered with orders for from seven units downward. An agricultural implement manufacturer made further purchases locally during the week.

Ordnance Requirements Feature Eastern Market

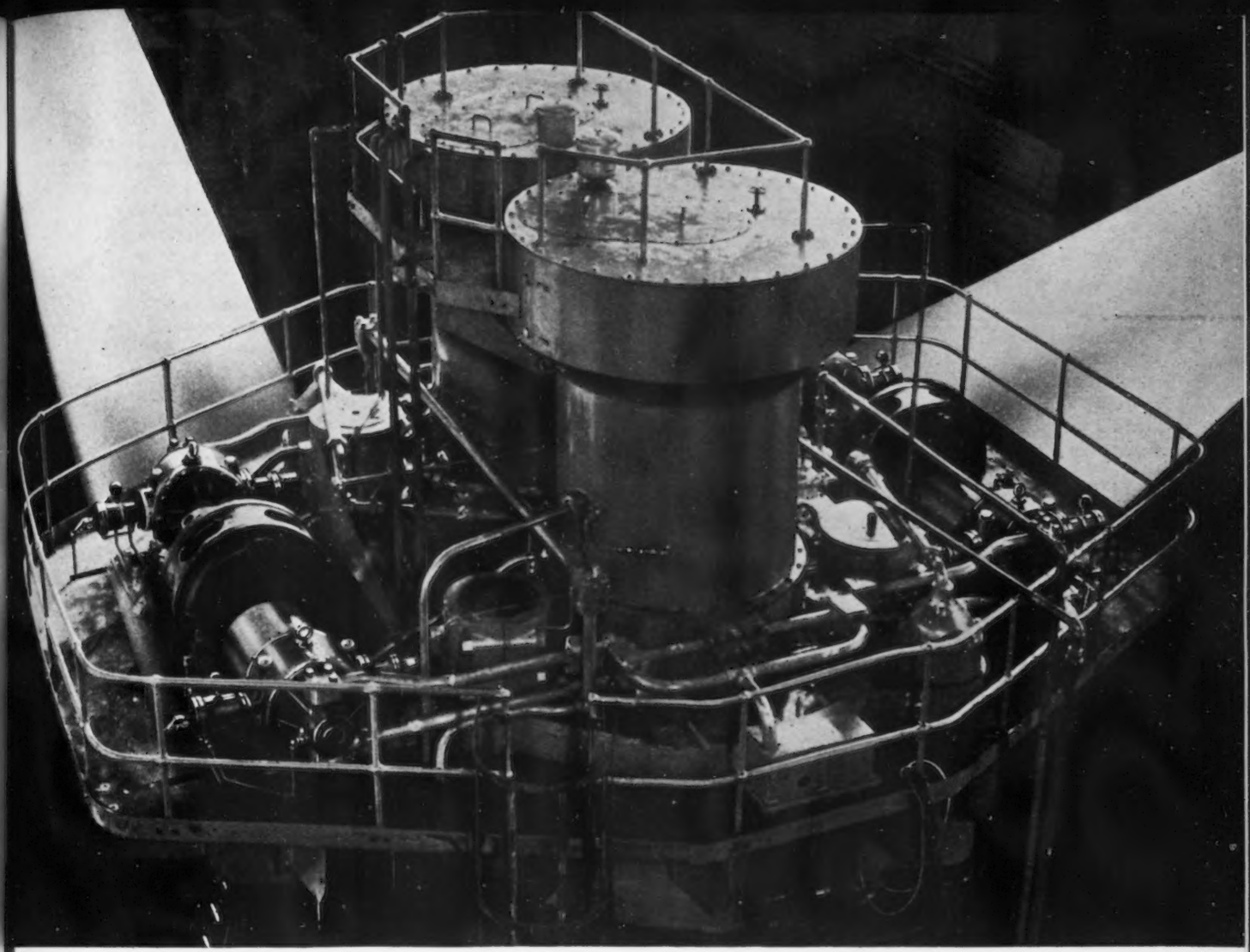
NEW YORK—Activity still centers around equipment for the manufacture of armaments and aircraft, but inquiries are coming from more general sources. The New York Central inquired for a turret lathe, the first inquiry for a machine tool put out by the road in over a year. Several of the large electrical equipment manufacturers have also issued inquiries, although in the case of one of them, the equipment is to be used for work on Government contract. Specifications continue to come out of the Brooklyn Navy yard, but very few orders have been placed for equipment on the 1939 budget owing to the long process of Navy routine. Dealers and factory representatives are extremely busy on quotation work, some report a fair volume of orders for the first half of the month, and all are optimistic as to a better sales volume this year, as compared with last.

International Harvester To Buy Against Lists Soon

CHICAGO—Machine tool sellers are anticipating the placing of some International Harvester business very soon. Most of the quotations have been received and orders should be seen at any time. Otherwise this market is quiet with only a fair number of machines being bought. Feeling, however, continues good.

INDEX OF ORDERS FOR MACHINE TOOLS

AVERAGE MONTHLY SHIPMENTS 1926=100%
3 MONTHS MOVING AVERAGE PLOTTED ON CENTER MONTH
NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
INDEX OF ORDERS (DOLLAR VALUE)
20 YEAR AVERAGE (1919-1938) = 85.0%
300
250
200
150
100
50
0
1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939



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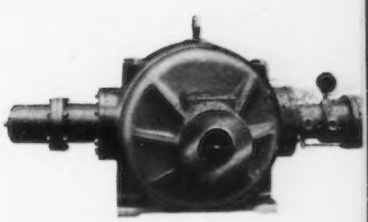
From the very moment the spotlight was turned on the H-P-M Hydro-Power Fastraverse Press, industrial leaders proclaimed it an immense "hit." Today it is the "Star performer" along many a production line. The H-P-M Hydro-Power Fastraverse Press comes naturally to this applause. The H-P-M Fastraverse System of operation not only achieved a new conception of hydraulic press performance, but provided a governing factor that was new in the annals of controlling tremendous pressures at high speeds. Thus . . . from feather touch to Herculean force . . . from snail pace to lightning speed . . . becomes a simple matter of adjustment . . . swift, smooth action with quick, shockless reversal, automatically at a predetermined pressure. An excellent example of the acceptance of the H-P-M Fastraverse System of operation is its use by another press builder. H-P-M and The Birdsboro Foundry & Machine Company joined forces in building three huge presses for foreign shipment . . . with H-P-M furnishing the entire operating system under patent license. These presses have a pressure capacity of 5500 tons. They are being used for the forming of airplane parts under the Douglas Aircraft Corporation patents. Your pressing problem will find a solution in the vast experience of H-P-M Engineers. Why not have one call? » »

THE HYDRAULIC PRESS MFG. COMPANY

MOUNT GILEAD, OHIO, U. S. A.

District Offices : New York, Detroit, Chicago. Representatives in Principal Cities



Tremendous power, concentrated in a small space, is provided by H-P-M Hydro-Power Radial Pumps. Only four of them are required to operate each of the Giants of Heavy Pressures built by Birdsboro. These are the only radial pumps on the market with the pintle and cylinder rotor separated by tapered roller bearings, thereby insuring against pump failures. The wearing, scoring or seizing of the pintle and rotor is now a thing of the past . . . where the H-P-M Hydro-Power Radial Pump is used. » » »

HPM

Closed Circuit

FASTRAVERSE OPERATING SYSTEM

Incorporating H-P-M HYDRO-POWER RADIAL PUMPS AND CONTROLS ★

Bridgeport Brass Opens New Rolling Mill

(CONCLUDED FROM PAGE 43)

conveyed by air to overhead storage tanks, from which it is fed to a vertical hydraulic baling press.

Inspection follows the overhauling. The flat bars are then delivered by crane to the four-high tandem mill (Fig. 3) which also receives for further reduction brass or copper in flat slabs from the hot mill.

Four-High Tandem Intermediate Mill

This intermediate or run-down mill handles both coils and flat slabs. Each stand is driven by an 800-hp. d.c. adjustable speed motor with suitable combination reduction gear sets. Both the working and backing up rolls are hydraulically balanced. Screw-downs of two-motor type are equipped with magnetic clutches to permit independent adjustment of the housing screws when required, and Selsyn type indicators show the screw setting at all times.

In addition to the four-high roll stands, the unit consists of a lifting table equipped with a pneumatic pusher-sticker on the entry side of the first stand, a roller top loading table at the outer end of the lifting table, and a coil sticker located between the loading table and the first roll stand. A three-roll coiler equipped with a tailing device is attached to the delivery side of the second roll stand. There is also a two-way coil conveyor, a coil opener for providing a straight-end on the coils when desired, and a return conveyor to the coil sticker loading device.

The lifting table and the pusher-sticker, similar to the one on the cold mill, is used for the first pass of flat metal. After passing through the mill, the metal is coiled on the three-roll coiler and air-ejected on to the coil conveyor, which holds about 25 coils. At the rear end of the conveyor the coils are transferred sideways on to another conveyor and returned to the coil sticker device for another pass through the mill, or they may be transferred to a storage conveyor which feeds a slitter-trimmer line in which is incorporated a scrap cutter and coiler.

Run-down annealing for coils from the four-high tandem mill is accomplished in a bank of four gas-fired, clean-annealing furnaces with a temperature range of 900 to 1300 deg. F. Fuel consumption and performance characteristics are variable for annealing either copper or brass. Coils to be annealed are loaded by crane on to heat-resisting alloy trays and placed on a motor-driven transfer car which runs on tracks parallel to the entrance end of the furnaces. Charging is effected directly from this car. As one tray of coils is pulled into the furnace by a motor-driven car puller, an annealed set of coils is removed from the sealed-in quenching chamber located at the discharge end of the furnaces.

Furnace temperatures are automatically zone-controlled, and by preventing the entrance of air into the furnace and quenching the metal in furnace temperature, excellent surface condition is retained.

From the run-down annealing furnaces the coils are passed through continuous pickling machines to prepare them for further running-down, or for the finishing mills. This pickling is accomplished in two types of equipment. For heavier gage metal a continuous push-through type machine is employed and for coils of lighter gage metal of various widths, a double-trough pull-through type unit (Fig. 4), operated at variable speeds, is used.

New Ready-To-Finish Mills

Next in the new plant production line are two new Bliss four-high ready-to-finish mills (Fig. 5) which further process coils brought either from the continuous pickling machines or directly from the annealing furnaces. The main rolls of these mills are independently driven by 400-hp. d.c. motors. Auxiliary equipment consists of an electrically-controlled tension reel with an air-operated block, blocker, hydraulic stripper and stripper carriage on one mill; a friction-clutch reel, with an air-operated block, blocker, hydraulic stripper and stripper carriage on the other mill; two uncoilers with expanding mandrel loaded by elevating transfer cars from the feeding conveyor; one rewinding reel with a hand collapsing block and stripper carriage; and a specially designed conveyor system which permits a continuous cycle of operation.

From these ready-to-finish mills the coils go to one of several finishing mills located in bay No. 2 for rolling to finished gages. These mills also receive coils directly from the continuous pickling machines.

All finishing mills are of more or less the same general design and are equipped with rolls of varying sizes. For the most part, they are reconditioned units employed in the old rolling-mill set-up. New units include a Farrel-Birmingham high-speed brass mill (Fig. 6). It has a double motor screw-down and a magnetic clutch that permits separate or simultaneous adjustment of each screw. A Selsyn controlled indicator on the operator's desk shows amount of adjustment to 0.0001 in., permitting very close control of the gage of the strip. The material is blocked on solid blocks at constant tension and is wrapped by means of a jaw-type wrapper. Full blocks are stripped by an air-operated stripper. In this mill, too, the reduction gear drive and pinion stand are combined in an integral unit. In the same bay, which is devoted entirely to rolling to finished gages, are two mills for finishing small orders and a mill for the special rolling required for engravers' copper.

From the finishing mills the coils go to another bay, where they are put through the finish-annealing furnaces and the finish pickling machines. The finish-annealing equipment includes twin-type recirculating, oil-fired annealing furnaces and continuous pull-through type gas-fired annealing furnaces for open and gas-atmosphere finish-annealing. Material that is finish-pickled passes to a group of inspection benches, and then to the final finishing department where it is prepared for shipment. Equipment here includes straighteners, slitters, shears, stretchers and circling machines. The completely processed material then proceeds directly to the nearby shipping department, which is adjacent to a railroad siding and truck platforms, thus completing its straight-line flow through the mill.

In addition to the advanced type rolling, annealing, pickling and other equipment, the building itself is of very modern construction. Features include unbroken window area of about 50,000 sq. ft. on all four sides of the building and an industrial type blower unit heating system that provides fresh heated air in the winter months and circulates clean, fresh outdoor air at other times. Generous shower, locker room and other conveniences have been provided for the workmen.

Some 10,000 sq. ft. in the basement of the new rolling mill will be used by the Bridgeport Engravers Supply Co., a subsidiary of the brass company, for the special handling and finishing of copper for photoengraving.